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Published by A. R. ELLIOTT PUBLISHING COMPANY, 66 West Broadway, New York.

Vol. CVI, No. 7. Whole No. 2020. | *A Weekly Review of Medicine, Established 1843* | Yearly Subscription, $5.00 Single Copies, Fifteen Cents

PHILADELPHIA — NEW YORK, SATURDAY, AUGUST 18, 1917. — CHICAGO

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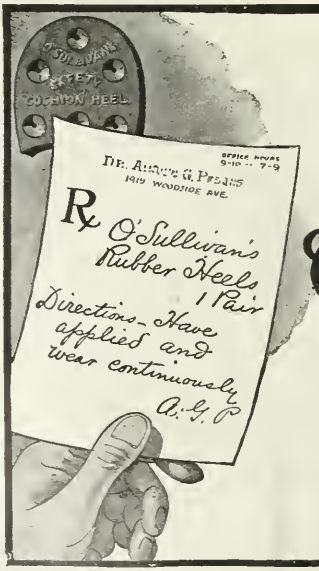

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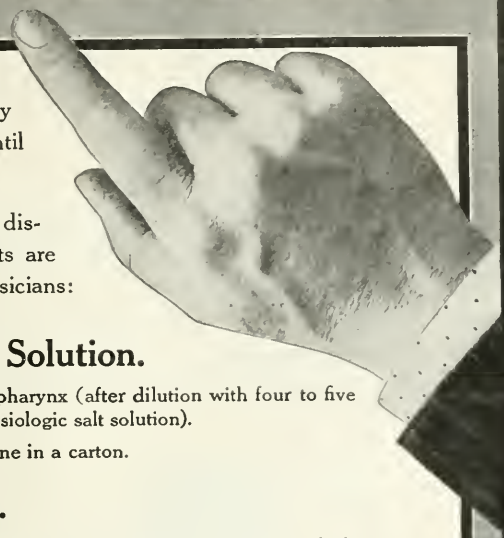

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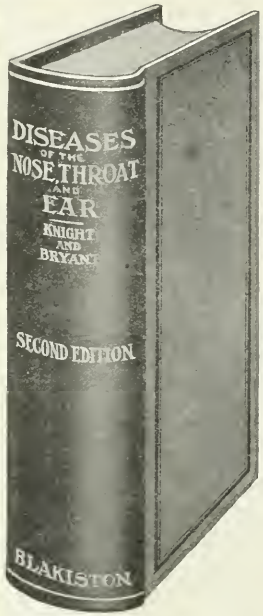

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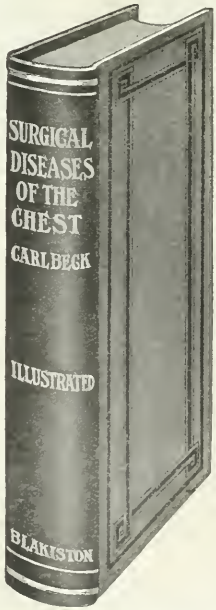

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VOL. CVI, No. 7. NEW YORK, SATURDAY, AUGUST 18, 1917 WHOLE NO 2020

Original Communications

RELATIONSHIP OF THE SYNDROME OF ANAPHYLAXIS TO THE VEGETATIVE NERVOUS SYSTEM.*

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Among the interesting phenomena for which modern medicine has demanded a solution, none has been studied with more interest than anaphylaxis. It is believed that when this phenomenon is thoroughly understood the subject of immunity will likewise be simplified. Richet (1) coined the word "anaphylaxis" in 1902. He conceived of the syndrome recognized as anaphylactic shock as representing a state of lessened protection—anaphylaxis—on the part of the organism so reacting. The reaction of anaphylaxis has been carefully studied and described by many students of immunity; and now so many facts concerning it have been brought forth that, when put together, we have a good understanding of its clinical manifestations, although we are much in the dark as to the real manner in which it is produced and its full significance. I shall not attempt to discuss the nature of the anaphylactic antibody except incidentally, but shall confine my discussion for the most part to the medium through which the reaction expresses itself.

Disturbance in visceral function occurs through the fibres of the vegetative nervous system, or through chemical substances—hormones. Before discussing the main point, I should like to call attention to the fact that phenomena which manifest themselves through disturbed function in internal viscera, express themselves either by stimulating the vegetative nervous system or through chemical substances, which are so selective in their action that they always act upon the same structures with a tendency to produce the same results. The action is usually that of stimulating one division of the vegetative nervous system either in its entirety or in part at the expense of the other. This is evident from the fact that internal viscera are supplied by two sets of nerves, one activating, the other inhibiting; consequently stimuli which disturb the normal nerve balance must act on one of these sets of nerves, either largely or exclusively. As an example, I shall cite adrenine, which is formed by the chromaffin tissue of the body, particularly the medulla of the adrenals. This passes into the bloodstream and circulates through the body, selecting and acting upon the structures which are innervated by the sympathetic nerves. Though acting peripherally at the myoneural junction, in its action it produces the same effects as would result from central stimulation of the sympathetic system. Carbon dioxide, on the other hand, is formed generally in the tissues, acts upon the respiratory centre, and expresses itself through the pulmonary branches of the vagus nerve.

It stands to reason that such chemical substances cannot be of the nature of antigens, otherwise their function would be interfered with, because specific antibodies would be produced which would destroy them. The production of such chemical substances—hormones, as they are called—is the function of certain body tissues; and if a disturbance in function of such tissues exists, a wider disturbance in function may result in other organs dependent upon these hormones for their stimulation.

Such disturbances as come from cellular reaction in defense of the body against foreign protein, whether of bacterial or nonbacterial origin, or from any form of inflammation in which foreign protein is concerned, are produced by substances which result in antigen antibody reactions. This we assume to be the nature of the substances which produce anaphylactic phenomena. If they were to express themselves, they would do so by causing a discharge of nerve force either directly or reflexly through the nerves belonging to the vegetative nervous system; or it is possible that they might act directly upon the tissues at the seat of contact, as the metabolites which result from muscular action or secreting cells are supposed to do in causing vasodilatation.

We cannot conceive of normal body reactions being other than purposeful. In order to understand reactions which are expressed as disturbances in function of the internal viscera, it is necessary to know something of visceral neurology. All unstriped muscles and all secreting glands are innervated by the involuntary or vegetative nervous system. This system, as far as function is concerned, is divided into two sets of nerves which are antagonistic in action and which by opposing each other determine action in the tissues supplied by them the same as the extensors and flexors control a joint.

*Read by title before the annual meeting of the American Association of Immunologists, April 6-7, 1917.

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These two systems are the sympathetic and the greater vagus. The latter is composed of the great tenth cranial nerve which is widely distributed to the internal viscera, and the vegetative fibres which run in the third, seventh, and ninth cranial and pelvic nerve, all of which have similar action to the tenth cranial in opposing the action of the sympathetics; the former comprises the fibres given off from the thoracic and upper lumbar segments of the cord.

We cannot conceive of a protective mechanism of the body being able to produce any particularly favorable reaction by expending its force on each of these systems in equal strength. If it did, normal equilibrium would remain and no purpose would be attained. Our conception is that the action is spent where it will aid the organism most. We cannot fully understand the purpose aimed at in every body reaction against harmful stimuli; but we are safe in assuming that it is primarily defensive. We must also not lose sight of the fact that a reaction might be primarily protective and yet prove to exert harmful influences. The inhibition of action on the part of the gastrointestinal tract during fright together with increased heart action, vasoconstriction, raised blood pressure, and forcing of glycogen from the liver into the bloodstream, and an increase of adrenine secretion which prolongs and strengthens such action, can plainly be understood as a protective measure. This is for the purpose of stopping all energy which is unnecessary for defense and utilizing the entire strength of the body for escape or attack. It can be readily understood, too, that if such reaction were prolonged, harm would result even though the primary purpose were salutary. This reaction results from a marked stimulation of the sympathetic nervous system, while vagus action is held in abeyance. Stimulation of the sympathetics which results in the syndrome of toxemia must also be purposeful and protective in spite of discomfort and disturbed function which result from it; so must the stimulation of the greater vagus which results in the syndrome of anaphylaxis. Unless we look upon all body reactions which are associated with the destruction of harmful invaders as protective, we mistake the purpose of the physical organism.

It is necessary to emphasize the fact that the vegetative or involuntary nervous system is not wholly divorced from central control. This is shown by the fact that many of the centres which preside over certain actions on the part of internal viscera are found in the brain. The functions of some of the internal viscera are also to a certain extent under voluntary control. The sympathetic and greater vagus systems can be stimulated either centrally or peripherally and produce action; consequently, disturbed function calls for an examination for both central and peripheral irritation.

Anaphylaxis is a reaction which results from the parenteral introduction of protein into the body, whether it gains access to the bloodstream through the mucous membranes, as when undigested protein passes through the intestinal mucosa, or whether it is introduced artificially. When protein is injected into the body, as has been shown by Vaughan, O. Cohnheim, and others, it may circulate in the blood and eventually settle in various tissues. Here it is sometimes found in condition neither ready to be utilized in metabolism nor ready for elimination. Its destruction in these tissues might produce local nerve irritation. When a foreign protein enters the tissues, it has the inherent property of stimulating a reactive mechanism which results in its destruction. Anaphylaxis is associated with the chemical action which takes place in the cleavage of this foreign protein. The character of the anaphylaxis depends upon the rapidity with which the cleavage of the protein molecules takes place. Thus either an acute or a delayed anaphylaxis may occur. It has been taught by some that the difference between an acute and a delayed reaction is due to the reaction being with cellular antibody in the former case and with circulating antibody in the latter. Weil (2) shows experimental evidence that all anaphylaxis is probably cellular. In medical literature the term anaphylaxis has been applied to many different conditions. Not only acute anaphylactic shock but all reactions which are associated with the specific, sensitizing molecule of foreign protein, are roughly classed among anaphylactic phenomena.

Expression of anaphylactic and toxic reactions upon the vegetative nervous system.—Not only does the elaboration of foreign protein result in an anaphylactic reaction, but also at times in a toxic reaction. From study of their relationship to the vegetative nervous system, these two appear as different reactions. There seems to be a general tendency to confuse the two; but the work of Vaughan in separating protein into a toxic, nonspecific and a sensitizing, specific molecule and the study of the toxic and anaphylactic reactions in their relation to the visceral nerves will show that these two reactions are, for the most part if not entirely, separate and distinct. This I shall now try to make plain.

The syndrome of toxemia is evidence of a widespread reaction which expresses itself as a general discharge of nerve force through the sympathetics. It is the same reaction, though differing in degree, no matter what the toxemia; and is always an expression of disturbed balance in the vegetative nervous system, in which sympathetic tonus predominates. It matters not whether the source of the toxins be the diphtheria or typhoid bacillus, pyogenic bacteria, tuberculin, egg white, peptone, or the broken down tissue of some organ which has resulted from inflammation; the reaction shows the same general characteristics, and consists of part or all of the following symptoms, according to the degree of toxemia present: Malaise; aching; chilliness or rigor; nerve instability; lack of appetite; slow digestion; constipation; loss of weight; rapid pulse; vasoconstriction; raised blood pressure; sweats; rise in temperature; blood changes, leucocytosis in which polynuclears predominate; lack of endurance; loss of strength. If the toxemia is very severe, there result vasodilatation, sweating, subnormal temperature, and collapse.

It will be noticed that these symptoms are an expression of increased sympathetic stimulation in all tissues supplied by that branch of the vegetative system, thus: 1, increased tone in the subdermal

musculature; 2, increased tone in the muscles of the bloodvessels and heart; 3, reduced secretion in all of the glands of the gastrointestinal tract; 4, reduced motility throughout the gastrointestinal tract; 5, as a result of this action, also partly from central stimulation as well, further changes manifest themselves, such as nerve instability, rise of temperature, general loss of strength, blood changes, as leucocytosis, and metabolic changes.

It would seem that the suggestions of Vaughan that the toxic molecule is found in all protein, is the same wherever found, and does not produce specific cellular resistance against itself holds good in clinical experience. This will explain why foreign protein is capable of producing either the syndrome of toxemia or anaphylaxis. It will also show why reactions of general anaphylaxis do not occur in chronic toxemias while toxic reactions do; also why general anaphylaxis does not appear during inflammation and necrosis of the patient's own tissues, while toxic reactions do. In order to explain the acute anaphylaxis found following experimental protein injection, it is only necessary to assume that the amount of the sensitizing or anaphylactic molecules set free is proportionately greater than the amount of the toxic molecules liberated, or that the newly stimulated cells are oversensitized. It is not unreasonable to assume that the acute sensitization which manifests itself in these early injections of new protein as compared with those which take place after a longer stimulation has occurred and a stronger specific cellular resistance has been developed, may be due to the fact that the sensitiveness of the reaction wears off with the development of greater specific protection. Clinical evidence bears this out, as is shown by comparing the phenomena which follow the experimental parenteral injection of a foreign protein into the body for the first time, according to the manner which has been found to produce anaphylactic phenomena, and the injection of tuberculin —tubercle protein—in the same manner into a patient who has been previously infected and immunized against tuberculosis. In the former case the anaphylactic phenomena are predominant and nearly always appear; in the latter on the other hand, the toxic syndrome is most common and nearly always appears if the dose is sufficiently large, while general anaphylactic phenomena are not observed.

The syndrome of anaphylaxis comprises some or all of the following symptoms: Itching; restlessness; sneezing; cough; rapid respiration followed in severe cases by slow bronchial spasm; increased bronchial secretion; nausea; vomiting; fall in blood pressure; fall in temperature; involuntary discharge of urine; involuntary discharge of feces; lowered coagulability of blood; diminution of polynuclear leucocytes, leucopenia; muscular weakness; convulsions.

It will be seen that while this picture is not wholly one of disturbed equilibrium in the vegetative nervous system, yet it is largely so; and if we exclude the symptoms which occur in severe anaphylactic shock, such as fall in blood pressure, fall in temperature, great weakness, and collapse, which are the same in severe toxemia and probably due to general injury to the central nervous system, we have almost a definite unmistakable picture due to greater vagus stimulation.

The next question is the point of action of the toxic and anaphylactic molecules. In our study of the sympathetic nervous system in relation to disease, we find that there are two distinct methods of reaction: one central, the other peripheral. The central stimulation is often general, expressing itself throughout the structures of the body innervated by this system. Again central stimulation may be selective, such as we find when the vasomotor centre is stimulated calling for vasoconstriction without a general sympathetic stimulation. General sympathetic effect may also be produced by peripheral action of adrenine on the tissues enervated by sympathetic fibres. Selective peripheral sympathetic stimulation may be seen in segmental stimulations, which manifest themselves as reflex action on the surface of the body, producing sensory, motor, and trophic changes in the muscles, subcutaneous tissue, and skin, which receive innervation from the segments of the cord which are in connection with the afferent impulses from some diseased organ, as, for example, is to be noted in the soft parts which receive their innervation from the cervical portion of the cord when the lung is inflamed. Greater vagus stimulation also may be both central and peripheral. The reaction in this division of the vegetative system is usually selective, being confined to one or a few branches. A general stimulation rarely occurs except in patients who are distinctly vagotonic. General anaphylaxis, however, seems to be an exception; for it shows itself as an expression of a more or less general stimulation of structures supplied by the greater vagus. The relationship of anaphylaxis to the greater vagus is evident by a comparison of the syndrome of anaphylaxis and the syndrome of vagotonia; and further by the fact that it can be prevented by using atropine, which opposes the action of the vagus. That the anaphylactic body acts peripherially is shown by the fact that the reaction still occurs when the cord and medulla have been destroyed and the vagus has been cut (4). This, however, does not preclude a central stimulation although it shows that at least part of the stimulation is peripheral. The fact that the vagus stimulation is general suggests either central stimulation or that the reacting antigen and antibody are widely distributed throughout the body.

During recent times we have gradually classified many clinical manifestations as being due to anaphylaxis. Among such are hay fever, asthma, and sensitiveness to strawberries and shellfish. The striking fact is that these phenomena are expressions of vagus stimulation. While the phenomena of acute anaphylaxis are as a rule more general, involving several divisions of the greater vagus, such clinical manifestations as those above mentioned are restricted to one or a few branches. The term anaphylaxis, with the meaning ascribed to it by Richet, can not be applied too strictly, otherwise we shall be led astray. The phenomena of anaphylaxis are apparently those which express

themselves, as far as the body structures are concerned, through the greater vagus system of nerves. That such phenomena are due to a protective mechanism can not be doubted, any more than we can doubt that the phenomena which express themselves through the sympathetic system in the face of danger are protective. We must not let the temporary disturbance in function blind us to the protective value of the ultimate outcome of the contest. In connection with this we must bear in mind that when the body meets danger, the very means of defense, although salutary and eventually successful may involve a temporary disturbance of normal function, just as the normal peaceful pursuits of a nation are upset while waging a successful war.

Relationship between visceral inflammation and the vegetative nervous system.—Parenteral digestion of foreign protein is accomplished as a result of the activity of the body cells; so is the elaboration of the patient's own tissues which are broken down by inflammatory processes. These actions are protective in character and result in products which act upon the nervous system; and, if present in sufficient quantities and surrounded by proper conditions, may produce either an increased sympathetic or increased vagus tonus, or both, as previously mentioned. It would seem that, whether we are considering experimental anaphylaxis, or the effects of the employment of tuberculin in one already infected with the tubercle bacillus—local and focal reactions—or hay fever, or asthma, or strawberry rash, or so called shellfish poisoning, the sensitizing, greater vagus, stimulating products are much more in evidence than the toxic products which act upon the sympathetic nerves.

In inflammations of internal viscera, we have the same process except that we are dealing with homologous protein; and if the inflammation is infectious, with both foreign and homologous protein. The breaking down of either native or foreign protein, however, is a matter of splitting up of the more complex protein molecules into less complex substances. The effect of cleavage of the protein of the patient's own tissues is also expressed upon the vegetative nervous system, although we assume that there is an absence of the necessity of the protective phenomena of sensitization which is so evident in cleavage of foreign protein. If the cleavage of either foreign or homologous protein is rapid, the toxic molecules are liberated continuously and, if in large amounts, produce the syndrome of toxemia. Again, as a result of the chemical action, products are formed which irritate the nerve endings in the inflamed parts; and these, probably, in conjunction with other stimulating agencies such as heat and pressure, cause peripheral irritation of the fibres of the vegetative nervous system. The result of this stimulation is shown in reflexes through both the sympathetic and greater vagus systems. Those through the sympathetic are expressed in sensory, motor, and trophic disturbances in the skin subcutaneous tissue and muscles of those areas of the body surface which are in segmental relationship with the afferent impulses carried by the sympathetic fibres to the cord. Those of the greater vagus show in other visceral divisions of the same nerve.

This may be illustrated by inflammation in the lung, which shows reflex sensory, motor, and trophic changes in the skin, subcutaneous tissue, and muscles which arise from the cervical segments of the cord, because the afferent impulses from the inflamed pulmonary tissue are carried by the sympathetic fibres and rami communicantes to this portion of the cord and there reflected through the spinal nerves. The vagus reflexes, on the other hand, show in cough, disturbed innervation of the larynx through both superior and inferior laryngeal nerves, slowing of the pulse which is often quite evident, and commonly some increased secretion and increased motor irritation of the gastrointestinal canal, spastic constipation being particularly common, and nausea and vomiting being frequently met during the acute inflammation accompanying cavity formation.

The relationship which general anaphylaxis bears to the greater vagus division of the vegetative nervous system suggests a close relationship between it and various clinical phenomena, such as hay fever, asthma, urticaria, and shellfish poisoning, as well as to the phenomena which take place during visceral inflammation. In order to understand these phenomena, it seems to me that we must approach them from the standpoint of their expression being a part of, or a result of, the body's defensive mechanism. With our present knowledge it may be impossible to venture a thorough explanation of these phenomena on this basis, yet one can find convincing evidence of this being their true nature. This is shown particularly well in the phenomena which follow inflammation. During inflammation the body is required to combat protein, either native or foreign, or both. As has been previously shown, this protein is broken up into two distinct groups of molecules, one of which, acting centrally, produces the phenomena of toxemia, expressing itself principally through the sympathetic nervous system; the other apparently acting peripherally stimulates both the sympathetic and greater vagus nerve endings. This produces reflex segmental disturbances in the skin and skeletal muscles through the former; and reflex, motor and secretory disturbances in other organs through the latter. The irritation through the greater vagus is apparently related to that which takes place in the cleavage of foreign protein, but from the nature of the case does not produce anaphylactic phenomena.

One can see an evident purpose in this combination. The segmental reflex through the sympathetics and their connecting sensory and motor spinal nerves, shields and protects the underlying inflamed organ by producing painful points over it and by limiting the movement of the muscles. The protective influence of the reflexes through the greater vagus is shown as an augmentor action on other viscera. If the toxic molecules were permitted to express themselves generally, unopposed for a prolonged period of time, upon the sympathetic nervous system, producing continuous inhibition, the patient would succumb; but the peripheral irri-

tation of vegetative nerves which results from the chemical action in the destruction of the protein, produces reflex greater vagus stimulation in the important internal viscera with an attempt to restore equilibrium of function. This is well illustrated in such chronic inflammations as tuberculosis where not infrequently in spite of such a degree of toxemia, as would be represented by a temperature of 102° F., which would naturally be accompanied by loss of appetite and a deficiency in motility in the stomach and intestines and in the gastric juices, we find the patients having sufficient vagus stimulation resulting from the local inflammation in the lung to preserve appetite, give a satisfactory amount of gastrointestinal juices, preserve motility so that the body processes may be carried on in such a manner as to maintain nutrition, and keep up the strength of the individual, or at least to minimize the inhibitory influences.

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ERYSIPELAS AS A COMPLICATION OF MASTOIDITIS.*

By Harold Hays, M. D., F. A. C. S.,
New York.

Many theories as to the causation of erysipelas have been advanced, and yet we are as much in the dark as ever as to the exact etiology. The various lines of treatment that have been suggested cover a list of drugs extending from the time worn treatment with carbolic acid to the newer methods of serum therapy. I have been fortunate enough—or unfortunate, as one may look at it—to have had erysipelas develop in a number of cases of mastoiditis, and I am therefore in a position to relate a few experiences and draw conclusions which are more or less important. The reason why otologists know so little about the treatment of erysipelas is that most of the ear patients in whom this disease develops are immediately transferred to other hospitals where they are lost track of. The result is that when a private patient acquires the disease we are obliged to call in some one else to take care of the case, or else we treat it in a haphazard manner. In my experience I believe that erysipelas is a complication of mastoiditis which in time will readily right itself and no damage need be feared as long as the patient has no other complication, such as diabetes.

Etiology.—The general consensus is that erysipelas is a localized infection of the skin due to a streptococcus. Moreover, the disease is considered contagious by some; by others, infectious. That the disease does not occur as frequently as it is thought one may conclude from the fact that there were only seventeen cases of erysipelas in the New York Eye and Ear Infirmary from January, 1912, to January, 1916. During that time, between three and four thousand patients were operated upon for mastoiditis, which brings the ratio down to less than four to a thousand, or about 0.4 per cent. These patients were not related to one another in any way. In other words, it was found that the cases occurred sporadically and that there was no direct infection from one patient to another, although when a patient acquired the disease there were often eight or ten other patients in the same ward. The ages of the patients ranged all the way from two to sixty-two years, the majority of them occurring between the ages of twenty and thirty years. Eleven patients were females and six were males. Of my private patients in whom the disease developed during the past two years, four were in females and one was in a male. In the cases in which smears from the ear discharge or from the mastoid cavity at operation were taken there was great variation in the character of the organism found. In six, the long chain streptococcus was noted; in two there was a mixed infection, and in two the pneumococcus was reported. Apparently the character of the organism found in the ear or mastoid cavity has no definite relation to the development of this complication. In my experience I am inclined to believe that erysipelas develops more often in females because of the maceration of the hair at the time of operation. On account of my belief that the infection arises from this source, I think it advisable to have the hair thoroughly washed before any operation on the mastoid, if it is possible to do so. This particularly applies to radical operations where there is plenty of time for preparation.

Some patients show a particular susceptibility to erysipelas. There is no doubt that in certain instances there is an hereditary predisposition. In two of my five cases the mother had had erysipelas. In another case the patient acquired erysipelas at the time of the first operation, which was performed by some one else, and again developed erysipelas when I had to do a secondary operation on her later.

I am firmly convinced that we cannot consider erysipelas either a contagious or directly infectious disease. I know I am at variance with the best authorities, but my personal experience has been such as to lead me to believe that only patients who are particularly susceptible can contract the disease from others. My reasons for this statement are as follows:

1. In the isolation pavilion in Bellevue Hospital are a number of patients with so called infectious skin diseases, all of whom are taken care of in the same pavilion and by the same doctors. The patients are separated so that the erysipelas patients are in one room, the impetigo patients in another, and so forth, but they are in close enough proximity so that infections could be transmitted. Moreover, it is reasonable to suppose that if the same doctors and the same corps of nurses take care of all these patients, frequently a disease would be transmitted from one patient to another. This seldom or never happens.

2. It is the common experience for erysipelas to break out in a surgical ward, and within the course of twenty-four to forty-eight hours such a complication is discovered. The ward is frequently emp-

*Read before the Otological Section, New York Academy of Medicine, April 13, 1917.

tied and fumigated, but it is seldom that the patients who are in the ward acquire the complication from the one patient infected. If the disease were contagious or highly infectious, one would expect other cases to occur, particularly as no special precautions are taken until the complication is discovered. Although the house surgeon doing the dressings may wear gloves, I have seen an intern wear the same gloves for all dressings, but take no precautions as far as the patients are concerned, except to dip the hands of the gloves in a bichloride of mercury solution.

3. In one of my recent cases before there was any evidence of a skin infection, a swelling developed in the neck below the mastoid wound, accompanied by a temperature of 104° F. As there seemed to be signs of infection, the patient was taken to the operating room and an incision was made, extending down through the deep fascia. No pus was found. Apparently this was a deep seated erysipelas which only came to the surface on the second day. In the meantime, however, four or five other mastoiditis patients were operated upon in the same room, without any particular precautions being taken. In not one of these cases did erysipelas develop.

4. I have frequently had to dress other mastoid wounds or to operate in other mastoid cases, either in the same hospital in which the first patient acquired erysipelas or in other institutions, and in no case that I know of have I ever transmitted the disease. Of course, one may argue that under these circumstance I took extra precautions, but there is no doubt in my mind that if erysipelas was a highly infectious disease I would have seen at least one instance of transmission.

5. I have never known a physician or nurse in charge of an erysipelas case to contract erysipelas. One would naturally think that if the disease were contagious or infectious such a complication would happen frequently.

It has generally been understood that the reason erysipelas develops so often as a complication of mastoiditis is because the pus from the wound has a tendency to spread out on the surrounding skin and in this way infect it. However, if one observes carefully, he will note that in the majority of cases, the erysipelas complication or infection occurs in front of the ear and not behind it. It is hard to explain why. We usually notice the dusky area of redness over the parotid region first, the infection spreading from this part forward over the face. If the suppuration from the mastoid wound causes the erysipelas, why does not the infection spread back toward the occiput, instead of forward toward the nose? The one case in which I have observed an infection on back of the head occurred in a patient in whom the erysipelas spread over the entire face affecting the other ear, and then extended back to the base of the skull. I have, therefore, come to the conclusion that the secretions from the mastoid wound or the infection of the mastoid cavity has very little to do with the occurrence of this complication. I believe the organism that causes the infection is present in the patient's hair and that the complication results many times from a lack of local resistance of the tissues in front of the ear. Another important fact arises here. It is possible that Nature is using up so much energy in the building up of the mastoid wound that she takes away a great deal of resistance from the tissues in the neighborhood. It is likely that the anastomotic lymph channels are filled with fluid which goes toward the mastoid wound and thereby depletes the surrounding area. If this is so, one can understand why such an infection takes place away from the mastoid wound and not in it.

Symptoms.—In the majority of cases that I have recorded, the complicating erysipelas took place on the second or third day after the operation, but in many the complication developed on the fourth or fifth day and in one instance it occurred on the ninth day after the operation. In one recent private case, a simple mastoid operation was performed on February 11, 1917, for a subacute mastoiditis. The patient left the hospital on the eighth day, and on the ninth day came in to see me with the wound almost completely healed. Four days later after he had gone home and while he was under the care of another surgeon—for I was ill—his temperature rose to 140° F. and he was again taken to the hospital. In this instance the erysipelas developed on the twelfth day in a patient in whom the wound was almost completely healed.

As a rule, the first symptom noted is a sudden high temperature which may or may not be associated with a chill. If neither sinus nor dura was exposed at the time of the operation, one may suspect erysipelas before any lesion presents itself, but if one or both of these structures was exposed during the operation, it is frequently necessary to delay diagnosis until other symptoms arise. As a rule, the first sign of the disease may be noted from twelve to twenty-four hours after the initial rise in temperature. The first sign is a dusky, brawny induration of the skin which has a sharp line of demarcation. If this is outlined with a silver nitrate stick, any extension of the inflammation may readily be seen as the disease progresses. Whenever the temperature suddenly rises high, I immediately look for a sign of inflammation or redness or brawniness in front of the ear over the parotid gland. If nothing is seen there, I am perfectly willing to expose the operated area to look for other trouble, such as may arise from a mastoid wound.

During the progress of the disease, the temperature remains remittently high—between 103° and 106° F. This temperature may be lowered somewhat by administering cold applications or antipyretics. It is better as far as prognosis is concerned for the temperature to remain high because this indicates that Nature is using all her powers to fight the disease. A low or subnormal temperature indicates some complicating lesion, usually very serious. At times the patient may become delirious mainly from the high temperature, but the delirium is usually of short duration and should not be a cause of worry. The beginning skin inflammation may be very small, but usually within the course of twenty-four to forty-eight hours the lesion creeps forward until the entire side of the face is involved. The lobe of the ear, the cheek, the nose, and eye-

lids are markedly inflamed and puffed out, and in the majority of cases the eye becomes completely closed. In two instances, I have seen the disease spread over the nose to the opposite side and in the one instance mentioned, the inflammation extended even behind the opposite ear. It is surprising to note that the chief complaint of the patient is a fear that the inflammation is beyond control. One must continually encourage him and insist that he is going to get well.

During the course of the disease, or even in the beginning, the blood count helps very little. The counts range anywhere from 22,400 to 5,800. The differential count is also of very little importance and is of little benefit in determining a prognosis. The differential count ranges from eighty-seven to seventy-two per cent. of polynuclears. The blood culture is of value only in eliminating a complication such as sinus thrombosis. It is negative in all cases of erysipelas.

Differential diagnosis.—When the temperature within the first twenty-four to forty-eight hours after an operation for mastoiditis rises to 104° or 105° F., one is naturally anxious to know the cause of such a condition. As no skin lesion indicating a complicating erysipelas develops during this time, one has to be on the lookout for certain other complications which are even more serious. Among these are primarily sinus thrombosis, and then brain abscess, meningitis, and pneumonia. Within a short time these other complications may be ruled out if the skin lesion presents itself. Usually when a patient runs a high postoperative temperature, one must resort to every means of diagnosis.

To rule out a sinus thrombosis or to determine whether it is present one must first recall whether the sinus was exposed during the operation, whether a perisinus abscess was present, or whether the sinus was accidentally injured at the time of operation. Although the white blood count is not definite in a sinus thrombosis, the relative count, or the proportion of polynuclears to the number of white blood cells, is of importance. As a rule, the number of white blood cells varies from 9,000 to 15,000, while the differential count is usually high—even eighty per cent. A blood culture should be taken. If it is negative, it may mean nothing, but if it is positive, the probability is that we are dealing with a sinus condition. Moreover an initial chill associated with high temperature appears in sinus thrombosis, the temperature becoming intermittent instead of remaining high.

It is more difficult at times to diagnose a brain abscess or meningitis, for the temperature remains high in these conditions as in erysipelas. However, in the first twenty-four to forty-eight hours after the onset of the fever, other evidence is usually present to allow one to determine what complication has occurred. If no definite signs are present, one must either open the mastoid wound and search for a brain abscess, or do a lumbar puncture to determine the character of the cerebrospinal fluid. There may be some rigidity of the neck in erysipelas, arising either from the mastoid operation or from the extension of a deep inflammatory condition to the muscles of the neck, but Koenig's sign is not present and the reflexes are not increased.

A deep seated pneumonia may frequently be difficult to determine or to differentiate. A lobar pneumonia may cause steady high temperature, but a bronchopneumonia will give an intermittent temperature. As a rule, the blood count in pneumonia is extremely high, ranging from 18,000 to 25,000 white blood cells. Such a high blood count is seldom present in erysipelas.

Prognosis.—From my experience in private cases in which erysipelas has been a postoperative complication of mastoiditis, I consider the prognosis extremely good, provided the patient has the proper care and attention to his mastoid wound and provided the erysipelas is treated properly. Such care contributes much to increasing the patient's general resistance to the disease, rather than in counteracting the inflammation locally. Although I am not cognizant of the general run of erysipelas cases, I am of the impression that the disease is rarely fatal, except in those cases in which there has been a complicating condition such as diabetes. As most of our erysipelas cases are transferred to other hospitals where we lose track of them, it is only in the private cases that one is forced to determine definitely the outcome. In my experience in private practice, this complication occurred eight times at varying intervals, no case being directly traceable to

CASES OF ERYSIPELAS 1912-1916.

Year.	Sex.	Age.	Disease.	Operation.	Day of Compl.	Temp.	W.B.C.	Dif.	Blood culture.	Infecting Organism.	Disposition of case.	Remarks.
1912	F	18	Ac. mast.	Simple mast.	4	104[2]	22,400	83	....	Strepto.	Transferred	
1912	F	9 mos.	Subperiosteal	Secondary	3	104[6]	.....	..	....	Mixed	Transferred	
1912	F	10	Om. P. C.	Radical	3	106[9]	.....	..	....	Mixed	.....	
1912	M	31	Ac. mast.	Simple	5	105[8]	12,800	83	Neg.	Strepto.	Transferred	
1912	M	2	Ac. mast.	Simple	7	103[4]	.....	..	....	.....	Transferred	
1913	F	26	Om. P. C.	Secondary	3	103	.....	..	....	.....	Transferred	
1913	M	24	Furuncle	Incision	1	103	.....	..	....	Mixed	Transferred	
1914	M	36	Ac. mast.	Simple	7	103[4]	.....	..	....	.....	Transferred	
1914	F	30	Ac. mast.	Simple	4	105[4]	.....	..	....	Strepto.	Transferred	
1914	F	9	Subperiosteal	Simple	4	104[2]	.....	..	....	.....	Transferred	
1914	F	38	Ac. mast.	Simple	9	104	.....	..	....	.....	Transferred	
1914	F	22	Ac. mast.	Simple	5	104[2]	14,400	75	Neg.	Pneumo.	Transferred	Erysipelas opposite side
1914	M	32	Furuncle	Incised	3	105	.....	..	....	.....	Transferred	
1915	F	36	Ac. mast.	Simple	6	105[8]	19,000	88	Neg.	.....	Transferred	
1915	M	54	Subperiosteal	Simple	2	105[1]	.....	..	....	.....	Transferred	
1915	F	61	Ac. mast.	Simple	3	105[8]	15,000	89	....	Strepto.	Transferred	
1915	F	10	Om. P. C.	Secondary; radical	3	103[4]	.....	..	....	Pneumo.	Transferred	
PRIVATE CASES.												
1916	F	22	Ac. mast.	Simple	2	104	.....	..	....	.....	Transferred	
1916	F	28	Ac. mast. (double)	Simple	2	104[8]	9,600	72	....	Staphylo.; strepto.	Cured	
1916	F	35	Ac. mast.	Simple	1	103	5,800	70	....	Strepto.	Cured	
1917	F	35	Ac. mast.	Simple	2	104[4]	9,000	72	....	Strepto.	Cured	
1917	M	30	Ac. mast.	Simple	12	104	.....	..	....	.....	Died	

another. One patient, the last, died from an acute nephritis. I shall cite the case briefly:

Case I.—J. O., male, aged thirty years, when first seen, had a subacute mastoiditis of six weeks' duration. There was edema and tenderness over the mastoid, profuse discharge of thick creamy pus from the canal which was very much narrowed. A simple mastoid operation was performed the following day. No dura or sinus was exposed. All except the lower angle of the wound was closed. The patient was out of bed on the fourth day and left the hospital on the ninth day with a clean wound almost completely healed. On the twelfth day, my associate, Doctor Smith, reported that the patient had a temperature of 104° F. He was again taken to the hospital. As I was very ill, I did not see the patient again. It was reported that erysipelas had developed in front of the operated ear, high temperature, 104° to 105° F., for ten days, then a sudden drop to normal, when suppression of urine occurred. Temperature rose two days later to 103°, and then remained irregularly high. The erysipelas spread down to the back. From continual delirium he passed into coma and died.

All the other patients made complete recoveries. In fact, although I feel very chagrined whenever erysipelas arises in any of my cases, I am so optimistic that I invariably give a good prognosis. Even when a patient is in very poor physical condition, a fatal outcome may not necessarily result. In one case, which I shall cite, a marasmic child of seven months acquired a general erysipelas after a double mastoid operation. The child got well after a prolonged convalescence.

Treatment.—No two physicians will use the same treatment for erysipelas, and as the majority of patients recover, one is forced to come to the conclusion that the patients get well in spite of treatment. In the class of cases of which I am speaking, there are two conditions to deal with: the mastoid wound and the complicating erysipelas, two distinct conditions, for, as I stated before, the erysipelas is seldom in the mastoid wound. The wound should be dressed under strict asepsis and with the same care as usually used, and should be taken care of before the area of erysipelas is touched. A sterile gown and sterile gloves should be worn. The wound and ear canal should be cleaned out in the usual manner, with particular precautions not to allow any of the instruments or dressing to touch any of the outside infected area. Antiseptics in the wound are totally unnecessary and often harmful; they tend to diminish the resistance of the newly formed tissue. A wet dressing of aluminum acetate or boric acid solution is very soothing and does no harm.

In care of the erysipelas lesion the treatment is both local and general. As I stated at the beginning of this paper, the various lines of treatment extend from the time worn treatment with carbolic acid to the newer methods of serum therapy. Among local applications may be mentioned ichthyol, carbolic acid, silver nitrate, tincture of iodine, mercuric ointments, and wet dressings of boric acid, aluminium acetate, magnesium sulphate, etc. Although we have a localized inflammation to deal with, the constitutional symptoms are out of all proportion to the extent of the local inflammation. In other words, there is a systemic change in the patient, a toxemia which varies according to the degree of his resistance. I have found it impossible to combat the disease locally. One must therefore resort to soothing local medication and not use drastic measures which may sear the patient for life. The most soothing application is a cold compress of a saturated solution of magnesium sulphate. The compress should go well beyond the inflamed area. As the eye on the diseased side is usually closed by the inflammation, it should be bathed frequently with warm, wet, cotton sponges. The edges of the nostril are dry and frequently cracked. Applications of liquid albolene or sterile vaseline should be made to the nostril and should extend well into the nose, as the inflammation does not stop at the edge of the nostril. Most patients complain of the tightness of the mastoid bandage, which irritates the inflamed forehead. Care should be taken to apply the bandage loosely or to place cotton on the forehead before putting on the bandage.

By far the most important part of the treatment consists in increasing the patient's resistance. The disease of the mastoid and the operation following have already affected the system. The high temperature in itself is not alarming as long as the erysipelas is spreading. It may be combated by frequent alcohol sponges or by the administration of antipyretics. It is preferable not to give such drugs as antipyrine, acetanilid, etc., on account of their depressant action on the heart. But aspirin, to which is added a small dose of caffeine, is permissible. I have not had much experience with the various serums, but I believe the general consensus is that they are of little use. No specific vaccine has been found. However, there is one preparation, Hiss leucocyte extract, which can now be obtained from leading drug houses, which I consider almost a specific for uncomplicated erysipelas, particularly when it is associated with ear diseases. Since the extract can be obtained commercially, I have used it in all my private cases with brilliant results. Within a short time the temperature has become lower, and in every instance the patient has recovered.

The theory on which the leucocyte extract is used is that it increases leucocytosis and by so doing greatly improves the patient's powers of resistance. The extract is made by causing a purulent exudate in the pleural cavity of a rabbit through the injection of a sterile aleuronat solution. After the exudate has collected in sufficient quantity it is aspirated, centrifuged, the sediment separated, and an extract made of it. The first experimental studies were performed to ascertain the effect of the extract in protecting animals against small doses of various bacteria—such as the typhoid bacillus, streptococcus, pneumococcus, meningococcus, and gonococcus. It was found that the extract had a decided protective action. Hiss and Zinsser (1) state: "The action of the extract may be due to an enhancement of the bacteriolytic action of the animal's plasma or to the action of digestive substances usually not liberated from the leucocytes; but it is most likely due chiefly to poison, neutralizing or destroying bodies which act on the endotoxins." In 148 cases of erysipelas treated by these authors with the extract, good effects were listed in all. The average duration of the disease was 3.1 days after treatment was

begun. Alexander Lambert (2) arrived at the following conclusion, after treating fifty cases of erysipelas by this method: "The extract will abort the infection if treated within the first forty-eight hours and will shorten the course of older infections. About fifty per cent. of babies under one year treated with the extract have quickly recovered." One of the large drug houses supplies the extract in ten c. c. sterilized syringes, with sterilized needles attached. Ten to twenty c. c. of the extract should be injected on the first day, ten c. c. the next day, and, if necessary, ten c. c. on the third day. The injection should be made in the buttocks or in the abdominal wall or under the breast. I have never seen an infection from its use in erysipelas. In a case of postoperative sinus thrombosis without erysipelas, a localized abscess developed, the infection probably coming from the blood. The injection is usually painful, but patients seldom complain of any subsequent pain. After the injections, the temperature gradually falls, and within a few days the local inflammation disappears. I shall briefly cite two cases:

CASE II.—E. P. C., female, aged thirty-five years, had a discharge from the ear for eight days with slight mastoid tenderness. X ray was positive. She was operated on for acute mastoiditis on the ninth day; temperature 100.4° F. On the first day after operation the temperature rose to 103° F.; on the second day to 105°, and erysipelas was seen. On the third day, ten c. c. Hiss leucocyte extract was given in the morning and ten c. c. in the evening. None was given the next day. On the following day ten c. c. was given, and on the fourth day, the temperature began to come down and the local inflammation began to disappear.

CASE III.—M. S., female, aged twenty-five years, had double acute otitis media for two weeks with slight mastoid symptoms. X ray showed disease of both mastoids. Operation on both mastoids was performed on the fifteenth day. Temperature rose to 103.8° F., and remained high on the following day, when signs of erysipelas were discovered in front of the right ear. Ten c. c. of the extract was given on the third, fourth, and sixth day after operation, or second, third, and fifth day after the diagnosis of erysipelas was made. Temperature then dropped to 98.8° F., and remained normal.

About a year ago, another line of treatment suggested itself to me, which would be particularly applicable to the extreme cases of erysipelas with high temperatures, prolonged delirium, and the extension of the inflammation. The treatment consisted of the directed injection into the gluteal muscles of the erysipelas patient of two or three ounces of citrated blood taken from a convalescent erysipelas patient. Such treatment has done wonders in scarlet fever cases, and Doctor Zinger told me that he had treated one erysipelas case in that way with gratifying results. Dr. T. Lawrence Saunders permits me to cite one case where this experiment, among others, was tried on an infant under his care who ultimately recovered.

CASE IV.—This was a marasmic child seven months old who had a double mastoiditis which necessitated operation after which bronchopneumonia and erysipelas developed. The erysipelas spread over the scalp and eventually reached every part of the body. No treatment was of any avail. I told him of my idea and, as I had a convalescent erysipelas patient who had just left Bellevue, we were able to get a small amount of her blood, which proved to be free from syphilis. The erysipelas eventually disappeared. The child acquired a number of small abscesses on the scalp, and elsewhere, which had to be incised. The child finally recovered.

Whether the injection of the blood had anything to do with the recovering will never be decided. As yet, I do not know whether the work at Bellevue was successful or not. I offer the suggestion, as it is in line with the newest work in the treatment of disease of unknown origin.

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11 WEST EIGHTY-FIRST STREET.

NASAL OBSTRUCTION A FACTOR IN THE PRODUCTION OF DISEASE.*

BY W. PEYRE PORCHER, M. D.,
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It has become a fad of recent years to attribute many diseases to anomalies of the teeth and tonsils. Like religious fanatics of old who called "fire and sword and desolation a godly thorough reformation," so extremists of today have gone for these organs tooth and nail, or tooth and tonsils, rather, and eradicated healthy and unhealthy organs on the bare possibility that pulp stones, rhinoliths, or some other pathological condition might be present. These organs, being visible and accessible, may be made to bear the brunt of ills, imaginary or otherwise. The teeth and tonsils do often become diseased and cause diseases of other organs at a distance. In fact, only recently two striking illustrations have occurred in my practice. The first was a case of rheumatism of the knee joint which had lasted for several months. A culture was taken from one of the crypts of the tonsils from which a pus discharge was exuding. An autogenous vaccine was made and administered hypodermically; the rheumatic pains promptly disappeared and never returned. The second case was that of suspected tuberculosis in a young man aged nineteen years. The patient had an afternoon temperature of about 99° F. which had been running for some time. A diagnosis of tuberculosis was made both by x ray and by vaccine, but an abscessed tooth was also found and treated, with the result that the fever promptly stopped and he has gained flesh and can take unlimited exercise without any rise in temperature. Of course, where diseased teeth and tonsils are so manifest the diagnosis should be easily made, but how often must obscure conditions in the deep seated cavities in the nose be overlooked unless the physician is thoroughly competent to make the diagnosis? In this age of medical enlightenment the failure to examine the nose and throat in many of the most common ailments which afflict humanity would scarcely be excusable. This does not apply, as is usually supposed, to diseases affecting the upper respiratory tract alone, because many affections of remote organs and reflex neuroses, etc., are directly attributable to nasal obstruction and diseases of the lateral sinuses. It has been common in recent years to attribute every case of migraine to

*Read before the South Carolina Medical Association, April 17, 1917.

some error of refraction. Of course, it is manifestly true that impure air or the improper performance of the function of respiration is far oftener productive of headache. As it has been said that headache is the cry of the brain for fresh blood, it must necessarily be true that it is the cry for more purified air.

I have been surprised to find that both graduates and postgraduates often completely ignore the organs of respiration. In fact, it is not uncommon for practitioners of medicine to boast of their ignorance of these important organs. There is only one way in which the gravity and importance of diseased conditions in the nose and throat can be recognized and that is by actual experience on the live subject clinically and on the cadaver. Unfortunately written articles and lithographic plates give but a poor impression of the relation of these parts or their clinical significance. Unfortunately also the diseased condition, if situated far back in the nose or in either of the lateral sinuses, cannot be easily demonstrated by one person to another. In fact even although complete relief may be given to a patient by a surgical procedure, it is often very difficult for the surgeon himself to see just what he has done. For example, in order to reach either the ethmoid or sphenoid sinuses, the anterior end or in some cases the whole middle turbinate has to be removed. This operation is commonly done, but careful examination is often required to see the parts after the removal of the bone. It would be impossible for me to give an idea of the wonderful results occurring after the restoration of the normal calibre of the nose except by giving the actual testimony of the patients themselves.

Most of these cases are tuberculous pulmonary or bronchial inflammations in which the disease in the nose has either been entirely overlooked, or, worse still, was purposely ignored as being in any way an exciting cause of the inflammatory conditions affecting the organs lower down.

For many years past innumerable papers have been written in regard to the early history and signs of tuberculosis of the lungs and bronchi. Where the early history points to a catarrhal condition in the nose as so commonly occurs, is it not rational to look to that organ for some predisposing cause? Of course, according to the modern teaching of the day, almost every inflammation of the lungs and bronchi is at once attributed either to a tuberculous diathesis or a predisposition to tuberculosis. This word predisposition means only failure or inability to diagnose the exact inciting cause of the disease. We generally say the patient caught a severe cold and acquired tuberculosis, yet how seldom do we make a critical examination of the nose to discover if there was any abnormal condition in the nose which not only rendered the patient more susceptible to what we call a severe cold, but keep up the inflammation so as to render the patient a fit subject for consumption? No scientific explanation has ever been given of the exact meaning of the words "inherited predisposition." Is it not rational to believe that these words mean a condition in the nose and throat which developed before the actual disease of the lung began? Although extremely tolerant of disease, perhaps more so than any other organ, the nose finally yields to repeated invasion and chronic processes set in. These processes may either be a simple cartilaginous spur projecting from the septum or a far more serious purulent condition involving the lateral sinuses.

In the opinion of most authorities and of the writer the presence of a cartilaginous spur is more frequently a factor in the production of acute inflammation in the nose than any other condition. By the mere fact of their presence the nose is rendered far more susceptible to inflammation and repetition of this inflammation results in chronic purulent conditions which end in serious involvement of all the air passages lower down. Is it not reasonable, therefore, that rigid examinations should be made for the presence of such inciting factors in the production of acute inflammation in the nose? Of course all this should be done long before there is any breaking down of lung tissue or persistent bronchitis or tubercule bacilli found in the sputum. I have in mind at present three cases which have more or less recently come under my observation in which this condition was markedly demonstrated.

Case I.—A lady had been under the care of a specialist in a neighboring city for several months for the treatment of pulmonary tuberculosis. On examination I found a large septal spur in her right nostril. As is usual in these cases there was no marked obstruction to respiration in this case or any outward sign of its presence. On that account I judge the specialist in whose care she had been deemed it of no moment and therefore did not urge its removal, or, perhaps as occurs in many instances, being a tuberculous case, he was afraid that the wound might take on a tuberculous condition and refuse to heal. I have known eminent specialists who refused to operate on this ground. It has never been my experience, however, that there was any retardation in the healing process. In this instance the operation was done with the electric trephine and was both bloodless and painless under cocaine and adrenalin. The patient at last reports was getting up at 4 a. m. and performing her household duties.

Case II.—A similar growth was removed from the nostril of a woman whose recovery was so complete that she was, at last report, skipping rope to reduce her flesh. When asked what portion of the treatment she derived the most benefit from she at once replied, "The operation on the nose."

Case III.—A young man not under my immediate care, was sent north for pulmonary tuberculosis. He was in a large sanitarium for many months and returned, having been benefited but far from well. He stated to me that the growth had been seen and recorded, but that no operation had either been performed or advised for its removal. His attacks of asthma and bronchitis had persisted after his return and he was finally operated on by a specialist in a neighboring State for relief of the nasal condition.

The astonishing fact is that this young man should have been so long under the care of eminent men who entirely ignored the presence of the growth. In this case the catarrhal condition in the nose was so manifest that any one sitting near to the patient could have easily detected it. Chronic purulent sinusitis had set up which needed repeated operations for its correction. The patient was in imminent fear of death before he got in the hands of a surgeon who advised immediate operation. Of course neither the patient or his physician could give credence to the fact that men of such eminence as those in charge of the sanitarium could

fail to appreciate the gravity of a purulent ethmoiditis as well as involvement of the surrounding sinuses. It would be needless to allude to atrophic degeneration or scab formation in the nose where the disease has progressed so far that the function of the nose as a purifier and moistener of the respiration has been almost entirely abolished. Here of course there would be asthma, bronchitis, cough, and finally breaking down of lung tissue. Chills, coryza, wet feet, drafts, etc., are the traditional causes of acute coryza, yet but few physicians look for the more frequent underlying or predisposing causes, namely, pathological conditions in the shape of sharp spurs, etc., in the nose itself.

To the bacteriologist, these influences resulting in a hypersecretion of mucus, merely supply a culture medium upon which the bacteria commonly present are able to grow rapidly. Under ordinary circumstances the nasal secretion is considered to be antigermicidal, but an inflammatory secretion, strange to say, is considered to be a most excellent medium for the growth of the bacteria and hence increased virulence is not improbable. It is stated that the symptoms of infection from different bacteria vary; certain bacteria, notably Micrococcus catarrhalis and Bacillus fœtidus affect chiefly the nose and pharynx, while others find their most convenient lodging place in the lower respiratory organs. Admitting, therefore, the truth of all this, it becomes all the more imperative to investigate all conditions of the inner nostril in any disease affecting the respiratory organs.

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THE SCOPE AND UTILITY OF FLUOROSCOPY.

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Röntgenoscopy, or examination by means of the fluorescent screen, is one of the important methods of Röntgen diagnosis. Because of the simplicity and directness of the fluoroscopic method, it has become an essential part of the equipment for clinical diagnostic work according to the most modern standards. At the present time, it is generally conceded that the information which may be gleaned from the x ray examination is sometimes pathognomonic and characteristic but always valuable either in the negative or positive phase; and when considered in association with the clinical data makes for great accuracy of diagnosis. It is this close relationship between the clinical and physical methods and the Röntgen method which must be emphasized. It is reflected in the important indirect contribution which röntgenology has made to these older methods, by correcting, amplifying, and elaborating them. These methods, the old and the new, must and do supplement each other and there is much truth in the statement of Wenckebach that he is the better röntgenologist who knows his clinical medicine and he the better clinician who knows his röntgenology.

A hasty survey of some of the difficulties in the differential diagnosis will indicate the gaps, unfortunately not a few, which röntgenology fills in our diagnostic knowledge. In the abdominal cavity the contribution has been well nigh revolutionary in its effect on physiological and diagnostic problems. So thorough a clinician as Dr. Ludwig Kast says in his article on the Influence of Röntgen's Discovery on Medicine:

> It is perhaps no exaggeration to say that in no field of internal medicine has Röntgen's discovery accomplished so much as in abdominal diagnosis. The contour, position, and motility of the stomach and intestines in the living were not correctly known until the x rays portrayed them on the screen. The new facts not only corrected previous findings, but also led to physiological discoveries of unusual value. Among these were the following: the importance of the tonus of the gastric muscle; the interesting play between the gastric peristalsis and the pyloric ring: the help which the antrum pylorus lends to the propelling force of the pyloric vestibule, churning and expelling the food within well defined rules; the importance of the pylorus in correlating gastric and intestinal secretory processes; the difference in the rate of discharge of different food articles; the segmentation and pendulum movements and the peristaltic rush of the small intestines; the antiperistalsis of the ascending colon and its relation to the ileocolic sphincter: the sweeping peristaltic waves of the colon, so different from the peristalsis of the small intestines; the formulation of the so called law of the intestines—the stimulated point leading to contraction above and relaxation below.

Its value in the differential diagnosis in diseases of the abdomen is so obvious as to make unnecessary any elaboration. The demonstration of gastric and duodenal ulcers, the accurate localization of abdominal tumors, and the determination of intestinal adhesions have become matters of routine, while with improvement in technic the diagnosis of gallstones is daily becoming more accurate. In the differential diagnosis of diseases of the chest the contribution of the Röntgen examination has been of exceeding value. A moment's consideration, let us say, of the pulmonohepatic region—a region where lie many diagnostic pitfalls—will emphasize this. The close anatomic relationship of the viscera in this locality, the similarity of the subjective symptoms due to their disease, the difficulty of isolating the objective signs, and the frequency of the concomitant involvement of several organs make this region in particular one wherein the utilization of every clinical and diagnostic method is essential for the proper interpretation of the pathological manifestations. The conditions which are likely to be confused with each other may be enumerated as follows: Consolidation of the right base with occlusion of the bronchi; pleuritic effusion, free or encysted; abscess in the lower lobe; bronchiectasis; pleural fibrosis with atelectasis; hydropneumothorax; pericardial effusion; diaphragmatic pleurisy; subdiaphragmatic abscess; abscess of the liver; diaphragmatic hernia—eventration; diaphragmatic paralysis.

On no mere theoretical or fantastic basis are the above conditions enumerated. The subjective symptoms of pain, dyspnea, cyanosis, cough, fever, and chills, though they serve frequently to indicate involvement of this or that particular organ, do not, however, always absolutely clear the diagnosis. Indeed, it may be said that the subjective symptoms, common as they are to most of the pulmonary diseases, have but little diagnostic value. For instance, there may be mentioned the similarity as to site, duration, and character of the pain of diaphragmatic pleurisy, basal pneumonia, and subdia-

phragmatic abscess, while the absence of pain in pleural effusion and liver abscess and the presence in both these conditions of chills, temperature, and dyspnea is generally appreciated. Occurring either as a complication of a pulmonary disease or otherwise, pericarditis with effusion does not always present a subjective picture which would serve to identify it. In fact, it is the complications of the pulmonary diseases which show subjectively only as an increase in the intensity of the symptoms which tax our diagnostic efforts. Nor can the severity of subjective symptoms always be accounted for by a proportionate variety and number of physical signs. Persistent cough and foul expectoration with the general effects of chronic pulmonary inflammation may show few and unimpressive physical signs.

The results of the physical examination may not always clearly determine the nature of the lesion. Pneumonia of the right base with plugging of the bronchi might be easily differentiated from pleural effusion, were it possible always to determine the degree of displacement of the heart. However, even with fairly extensive right sided effusion, this cannot always be done. The diagnosis of postpneumonic conditions presents many problems so familiar as not to require elucidation but it is sufficient to say that their immediate solution is not always possible by clinical means but much watching, waiting, and persistent scrutiny are necessary. The differential diagnosis between pleural effusion and subdiaphragmatic or liver abscess is difficult because the physical signs may be identical. Even the insertion of a needle and the withdrawal of pus does not tell all, since it is not easy to decide whether the pus came from above or below the diaphragm. The difficulty in the differentiation of emphysema from a partial pneumothorax is well known, as is the problem of determining the extent and size or even the presence of an effusion associated with pneumothorax. Variable dullness with diminished respiratory murmur and marked costovertebral tenderness may be the only physical signs of a perinephritic or of a liver abscess.

Again, an enlargement or displacement of the right heart may be indistinguishable from a patch of consolidation in the lower anterior portion of the right base through which the heart sounds may be transmitted with great clarity, in marked contrast to their feebleness over the left side, because of a possible emphysema. A pericarditis with effusion may be mistaken for dilatation of the heart. Consider eventration: Its general clinical picture with more or less sudden onset with respiratory crisis suggests the advent of pleurisy, and the physical findings of tympany, respiratory immobility, and cardiac displacement will suggest hydropneumothorax, yet the x ray appearance is absolutely characteristic and pathognomonic.

A definite train of gastric and intestinal symptoms is associated with congenitally small hearts (Laennac, Virchow, Muller, His, Wenkebach, Adler). Röntgenologically this condition is simply and graphically demonstrable. The diagnosis of aneurysm by the older physical methods, responsible for much clinical humility (Osler), is far surpassed in accuracy and definiteness by the Röntgen method. The diagnosis of incipient tuberculosis by the ordinary physical methods is difficult because of the scarcity of signs, the normal variations in the percussion note and respiratory murmur at the apical area and the difficulty in the differentiation of the intrapulmonic from the adventitious sounds.

Besides this the beginning processes of pulmonary tuberculosis are, as proved by Rieder, Ghon, and others, not in the apices, but in the central portion of the lung in or about the hilum and its lymph nodes and these changes are not readily registered by physical signs. By the Röntgen method, however, the variety, shape, size, and manner of extension of the early and late changes are frequently made manifest before physical signs disclose them. Though it is conceded that some of the earliest changes are not pathognomonic of tuberculosis individually or collectively, still, when studied in conjunction with carefully analyzed data, they gain in importance as evidence, and the later changes are usually proved radiographically to be more extensive than the physical signs would indicate. The signs of diffuse miliary infiltration may be only a little roughening of the respiratory murmur. Cavitation may exist without audible manifestations. Tumors of the lung, metastatic or primary, give but few signs and symptoms early in their existence. Extensive bronchiectasis may exist with few signs. The operative treatment to which this latter disease is being subjected necessitates the determination of the number, form, size, and location of the bronchial dilatation. This, particularly where multiple foci exist, cannot be done clinically.

Patches of consolidation in central portion of the lung are surely overlooked with great frequency, if, according to Wintrich, a patch of consolidation needs to attain the size of two by five centimetres and be superficially situated in order to produce sufficient percussion dullness. Yet the smallest of such foci may be isolated by the Röntgen method, and it behooves the clinician to utilize the data furnished by the x ray examination, data which are accurate records by physical agencies, requiring but proper interpretation for their translation into valuable knowledge. The tendency to discredit or ignore what workers in this field have accumulated by laborious research and painstaking effort is deplorable. It is deplorable, too, that the knowledge of the interpretation of the fluoroscopic and radiographic picture is not more general and it is surely incumbent on the medical man to acquaint himself with the röntgenological appearance of the structures as it is with the appearance of a granular cast or the tubercle bacillus. Not that the last word in interpretation has been said, but sufficient has been established on well proved grounds to make the method indispensable to the clinician. It is conceded that in some points the Röntgen diagnosis has not as yet attained incontestable form and that the method is not infallible, yet these are no excuses for its neglect. Who will contend that the last word has been said on auscultation or percussion? Surely, as has been pointed out, these time worn and time honored methods have been studied by the best medical minds these hundred years, and yet even today a voluminous literature testifies amply to the fact of their incompletion and fallibility.

Time was when the practice of this diagnostic art was entirely in the hands of the Röntgen specialist. But, through the labors of these workers the methods and the principles have been so elucidated that the torch may now be passed to the internist for the illumination of the devious and dark paths of clinical diagnosis. The plate examination is comparatively far more complicated than the fluoroscopic and requires numerous accessory appliances, and though it has the advantages of permanency and greater accuracy of its records, nevertheless, the simplicity, convenience, and rapidity in obtaining results make the fluoroscope an instrument of greater general utility.

The requisites of safe and successful fluoroscopy are: 1, a ray of proper quantity and quality; 2, a screen of proper quality, size, and suspension; 3, proper sensitization of the eye; 4, protection from deleterious effects. Careful attention to the first three requisites will continue in a large measure to the establishment of the fourth. Generally speaking, the fluoroscopic stative should be of such construction as to permit the maximum mobility of tube, patient, and screen. This means independence of screen movement from tube movement.

The x ray tube should be completely enclosed in a box lined with lead, the container being more heavily covered over the active hemisphere. The tube box should be equipped with iris or a slit diaphragm of both, the latter being of greater utility. Means for cooling the tube should be provided; a fan is usually sufficient. The opening of the box should be at least five by five inches and covered by a sheet of aluminum one millimetre thick. The box is to be suspended by counterweights and to be freely movable in all directions by a single handle which should also contain the handles for diaphragm and be long enough to bring the hand of the operator moving the tube completely out of range of the most divergent ray. The tube box should hang on a device which makes it part of a lead partition which moves behind another immovable lead partition containing a large fibre window against which the patient rests. In this way a double lead partition with an intervening air space is provided. The distance of the target of the tube from the patient should not be less than twelve inches.

The fluoroscopic apparatus is to stand firmly and a ledge or forward supports are to be avoided so that a couch or chair may be wheeled directly against the permeable fibre window. Means should be provided for a shelf or a table to be placed in front of the permeable window in order to permit the examination of the patient in the lateral position. All that has been said in reference to the vertical fluoroscopic stative holds true for the horizontal excepting that it seems preferable in many instances, on account of giving greater comfort to the patient, that the canvas topped horizontal table be used. Means should be provided for keeping the canvas taut.

The screen is to be suspended independently by counterweights and should be of such weight and suspension as to be closely and firmly against the patient without pressure. The screen should furnish a maximum illumination with a minimum amount of current, proper contrast, freedom from lag, permanence of coating, airproof mounting, and lead glass protection. Screens with considerable lag are a disadvantage when studying the movement of the various organs. It is an advantage also to have an arrangement on the back of the screen whereby the plate holder may be clamped in any position for the purpose of making an exposure during fluoroscopy. Means should also be provided for easy and rapid tracing of the fluoroscopic image, as drawn on the lead glass, on tracing paper attached to the screen holder. A fourteen by seventeen screen should be used in all instances when possible, even though the entire screen is rarely illuminated during fluoroscopy, it nevertheless offers a certain amount of protection to the operator. From the lower edge of the frame of the screen should be suspended an apron of lead rubber at least eighteen inches long and as wide as the screen. Several cuts in this will permit the use of the palpation spoons.

Too great emphasis cannot be laid on the problem of protection. The Röntgen ray is an agent capable of causing considerable damage to the organism. Though this appears to be generally appreciated, it is nevertheless surprising to note the utter disregard of this danger during fluoroscopy, particularly with the use of the Coolidge tube, where many of the limitations which gave a certain margin of safety when the Crookes tube was used do not exist. Carelessness in providing suitable protective measures is bound, sooner or later, to lead to disastrous results. It must not be forgotton that the late skin effects may, and usually do, come on from four to seven years after prolonged exposure. Immunity from such effects for a year or two instils a false sense of security. Eternal vigilance is the price of an intact skin. Such additional protection devices as lead rubber gloves are essential and ordinary leather gloves should be worn underneath the rubber gloves. As a substitute for the hand, compression should be made with the wooden compressor, spoons, or "distinctor" as Holzknecht devised it. Lead glass goggles and leaded aprons are useful in further increasing the safety of fluoroscopy. The tube, if of the Crookes variety, should be of medium focus and "air regulated"; if of the Coolidge variety, the "sharp" focus tube.

The quality of the tube should be such that three to four milliampères may be used with a tube of sufficiently high vacuum to back up from five and one half to six and one half inches in equivalent gap. What should be sought for is detail with sufficient contrast. Should it be necessary to move in and out of the fluoroscopic room, colored glasses should be worn. Sensitization of the eye is extremely important. The illumination of the fluoroscopic room should always be indirect, dim, and of a bluish green tint, the color of the fluorescence of the screen. Sensitization may also be accomplished by tiring the eye for its complementary color, red.

Previous to the examination, the room, which should be well ventilated and the air kept in motion, should be darkened. The observer should remain in partial darkness for at least ten minutes and in absolute darkness for five minutes, before

the first examination is begun.[1] The visible light from the tube itself must be eliminated. The static glow of the wires carrying the high tension may be eliminated by the use of a tin or iron piping or heavily covered cable. The patient should stand or be seated on a revolvable stool directly against the stative. Those who are too ill, may be examined directly on the horizontal scope or on a chair with a canvas back against which a vertical stative may be placed. It is not necessary to bare the body. A buttonless or hookless shirt prevents irritation of the skin of the precordium which may manifest itself reflexly as a variation of heart action—myopathic heart reflex.[2] Besides this, the wearing of a shirt helps to reassure and calm the patient, who is usually frightened by the circumstances attending the examination and emotional quiet is essential for the proper examination, particularly of heart cases. The examination in the vertical position should be followed by one in the horizontal posture.

The examiner should have everything at hand, so that there need be no stumbling or fumbling in the dark or turning on of lights. The examiner need not necessarily stand directly in front of the screen, for the observations may be just as accurately made when standing to one side and thus out of the direct path of the rays. The examination must be thorough but rapid. The energizing of the tube must be intermittent. It is a foolhardy and useless procedure to fluoroscope a patient over a long period of time. A glance and then an interval for orientation and thought, then another period of observation, followed by a period of darkness for consideration as to what is observed and what is to be sought or still to be determined. By this method the interest of the patient is safeguarded and prolonged exposure is prevented. It should always be borne in mind that there exists an idiosyncrasy on the part of some individuals to the ray. This has been established beyond a doubt. The "dried out," emaciated individual, suffering from old nutritional disorders, is to be subjected to an examination for a shorter period of time than the average case.

Working with a gas tube, whose equivalent spark gap value is seven inches or with a Coolidge tube of six inches and using two to three milliampères of current, through one millimetre of aluminum, an exposure of fifteen minutes is the limit of safety at the usual target skin distance if a skin reaction is to be avoided. With the constant moving of the body of the patient, incidental to the examination in all directions, no part should, therefore, even receive a large fraction of a skin dose.

The thorax should be studied according to the following scheme:

SCHEME FOR RÖNTGENOLOGICAL STUDY OF THE CHEST.

1. PULMONIC FIELDS:
   - Shape { Triangular / Rounded / Irregular
   - Size { Height { Equal { Large / Medium / Small } / Unequal } / Width { Equal / Unequal }
   - Illumination { Bright / Brilliant / Deficient / Absent } { General / Local { Location / Borders { Sharp / Indefinite } } }
   - Expansion { Equal / Unequal / Diminished }
2. HILUM SHADOWS:
   - Shape
   - Size
   - Structure
   - Density
   - Calcification
   - Pulsation
3. PULMONIC MARKINGS:
   - Number
   - Size
   - Shape
   - Extension
   - Density
   - Distribution { General / Local }
4. TRACHEAL AND BRONCHIAL OUTLINES.—Air Content:
   - *Trachea*—
     - Size
     - Shape
     - Position
     - Bifurcation (site)
   - *Main Bronchi*—
     - Relation to hilum shadow
     - Relation to aortic arch
5. DIAPHRAGM:
   - Position (relative)
   - Shape
   - Contour { Regular / Irregular { Concave, wavy / Convex, billowy }
   - Movement
6. VERTEBRA, RIBS, AND SPACES:
   - Structure
   - Direction
   - Width
7. COSTODIAPHRAGMATIC SPACE:
   - Size
   - Shape
   - Illumination
8. MEDIAN SHADOW:
   - Outline { Left aorta / Pul. art. / Left auricle / Left ventricle / Right auricle / Right aorta }
   - Size { Small / Normal / Large }
   - M. R. .....Maximum deviation of heart shadow to right of median line
   - M. L. .....Maximum deviation of heart shadow to left of median line
   - T. . .....Total heart width = M. R. + M. L.
   - P. .....Total pneumonic field radius
   - L. .....Heart length, "apex to base"
   - V. .....Angle of ventricular line to horizontal = 45°
   - Position { Normal / Transposed / Displaced }
   - Axis { Vertical / Oblique / Transverse }

[1] Precise measurements have shown that ten minutes in the dark increases the sensibility of the retina to the light of the fluorescent screen fifty to one hundred times. After twenty minutes in darkness the sensibility is increased 200 times.

[2] According to Abrahams the degree of myocardial retraction, that irritation of the precordial region produces, as estimated by the x ray, 1.2 centimetres.

Shape { Normal / Spherical / Oval / Triangular / Rectangular }

Movements { As a whole / Its individual chambers / The great vessels }

9. Aorta:
Size { Small / Normal / Large { Length from junction of right auricle to summit of arcus / Width { At base / At arcus } } }
Shape { Ascending / Arcus / Descending }
Position
Density
Movement

10. Upper Mediastinal Shadow:
Size
Shape
Outline
Position
Tracheal position

11. Retrosternal Space:
Size
Shape
Illumination

12. Retrocardiac Space:
Calcification
Shadows

13. Esophagus[1]:
Pathological Findings
Interpretation
Diagnosis

The examination should be made in a systematic and definite manner, each portion of the pulmonic fields and the central shadow being scrutinized in a regular definite sequence. The tube is centred over the middle of the chest and the diaphragm opened widely so as to obtain a view of the entire thorax. The tube is so energized that the pulmonic fields are just barely visible, for in this way slight differences in illumination and the variations in illumination during quiet breathing can be determined. This is not so readily appreciable when the fields are later fully illuminated for the study of the pulmonic markings. The illumination of the screen is gradually increased until the proper view of all the detailed structures of the lung is obtained and a rapid survey of the entire thorax is made. The diaphragm is then closed to a horizontal strip and moved so as to bring both apices in view, and their illumination is then compared. The slit is then closed laterally so as to show but one apex at a time and these are now carefully studied for miliary or peribronchial infiltration, pleuritic thickening, etc. Thus successively, first with longitudinal slit, both and then the individual pulmonic fields are covered from apex to base, and finally a comparative study of the domes of the diaphragms is made.

With a vertical slit, the hilum shadows are studied, first comparatively, then individu lly. Finally the borders of the median shadow are scrutinized, the maximum deviation to the right or left of the central shadow roughly measured and compared to the diameter of the right pulmonic field at the level of the highest point of the right diaphragmatic dome.

A relative accurate orthodiagraphic tracing of the heart shadow may be made without the use of the special complicated and dangerous orthodiagraphic apparatus. One method is to fix the screen firmly against the chest. With a narrowed diaphragm, not more than one centimetre square, the contours of the heart are traced so that the heart outline bisects the small square of illumination of the screen. The heart outline may be traced on the chest of the patient, by using a small screen, six by eight, which in its centre contains a perforation large enough to admit a pencil point. The screen is attached to the handle of the tube container in such a way that tube follows freely every movement of the screen. With a diaphragm opening in the tube box sufficient to illuminate the screen, the heart borders are marked out by a series of points on the skin through the hole in the screen when the hole, showing as a dark spot on the illuminated surface, falls at the periphery of the heart shadow. In both these methods it is important that the tube be centred in its container so that with the smallest workable diaphragm opening the central ray is obtained. When the perforated screen is used, the screen must be so adjusted that the central ray passes through the perforation. Means should be provided for making a tracing of the fluoroscopic image. This may be done in two ways. It may be made directly on the glass covering of the screen and from this transposed to paper, when the examination is at an end. Another method is to affix an arrangement to the screen, whereby a piece of clean glass upon which the tracing is made may be slipped in front of the lead glass. The patient's name and other data are placed thereon and this may be filed in an envelope as a record or transposed to paper. Tracing paper may be suspended on a roll at the top of the fluoroscopic screen, so that a piece may be pulled over the screen and a tracing made. The tracing of the heart borders and the diaphragmatic domes should be made during normal breathing and also at the end of forced inspiration and expiration, in vertical, horizontal, and lateral postures. Such records of a case gives considerable information regarding limitation of motion, not only in respiratory but also in cardiac and pericardial diseases.

Two manipulative procedures are utilized in fluoroscopy: palpation and magnification. In röntgenoscopy of the chest palpation is not necessary but magnification is extremely important. The withdrawal of the screen not only adds contrast to the diaphragmed image but magnifies it and thus gives valuable information. By this procedure, for instance, the pulsations of the hilum shadow in mitral disease and even in normal but very thin individuals may be made out. Shadows due to calcareous deposits may be differentiated from shadows of large vessels seen in cross section, etc.

[1]For the examination of the esophagus a special bismuth mixture should be used. This consists of a teaspoonful of mucilage of acacia in which is suspended by thorough stirring one heaping tablespoonful of bismuth. A part of a teaspoon of the resulting colloidal mixture is sufficient to clearly outline the entire esophagus and permit the study of its lumen, walls, and peristalsis. The examination must be made in the oblique positions. (1)

Palpation may be made with the hand or with the wooden spoons devised by Holzknecht. The modified Buicky diaphragm and compression cylinder as devised by Lippman, renders great service, not only as a means of compression, but for the fine differentiation of structures. Particularly in the examination of the abdomen, fluoroscopy without palpation is but one half of the examination. Palpation permits the study of the outline and differentiation of actual defects due to invasions of the visceral wall from extravisceral conditions causing pressure; the determination of fixity and mobility and of areas resistant or sensitive to pressure; the isolation of shadows and their localization; the stimulation of peristalsis; the artificial blocking for the study of the lumen by overdistention.

For the study of the gastrointestinal tract the administration of a contrast mixture is, of course, essential. Previous to the administration of bismuth the abdomen should be studied on the fluoroscopic screen for the purpose of determining the presence of excessive gas. Normally the air may be visible in the abdominal cavity in several positions. 1. In the left hypochondrium an oval shaped shadow directly underneath the diaphragm is due to gas in the cardia. In the normal stomach it is of oval shape, its long axis parallel to the long axis of the body and situated in the central portion of the diaphragm. The height of the oval shadow diminishes and the width increases as the organ is filled and it becomes semicircular in shape. In marked dilatation of the stomach it is very large, wide, and semicircular and is visible as such when hypersecretion exists and a determination of the fluid content may thus be made before the administration of bismuth. 2. In the region of the bulbus duodeni, it appears as a triangular or rounded bubble. 3. It may be seen in the region of the cecum; 4, in the splenic flexure of the colon, particularly in the proximal part, and 5, in the rectum.

The examination is continued by palpatory fluoroscopy with a nonsuspended mixture of contrast salt in water. The contrast salt sediments rapidly through the water in the stomach to the greater curvature and pylorus. By palpation it may now be spread over part of the stomach wall. The value of this procedure lies in that it permits: 1. The study of the method of filling the stomach. This should be studied by individual swallows of contrast mixture. The morsel drops from the esophagus, halts at the narrowest portion of the collapsed stomach and then glides along the lesser curvature to the pylorus and then the greater curvature. The deviation in the course of the stream or in the method of filling gives many important clues. 2. The determination of mucous membrane irregularities. Such irregularities in the lumen as are produced by tumor formations, a niche or a diverticulum, may be outlined by the mixture, the granules of bismuth being deposited within these crevices. The above morphological data may also be determined by the usual suspended contrast mixture but because the stomach is thus completely filled with contrast mixtures, small penetrating or perforating ulcers on the posterior wall will be overlooked. 3. The study of the stomach tone. The tone being the property of the gastric muscle by which it maintains its contents in tubular form, a normally tonic stomach will be full—fluid level—with five ounces as with fifteen. 4. The study of the antral activity. The actions of the antrum may be observed because the water is not retained in the stomach and the peristaltic activity begins almost immediately; thus the hyperactivity of the duodenal ulceration or the lessened waves of the atonic stomach resulting from old pyloric ulceration may be noted. 5. The study of pyloric patency. The pyloric incompetency of a scirrhus infiltration of the pylorus without antral contractions can be differentiated from the rapid outflowing associated with hyperperistalsis, of duodenal and periduodenal disease. 6. The study of duodenal morphology. Either by pressure on the pylorus or by blocking at the pars horizontalis inferior of the duodenum, the pars descendens, and pars superior and bulbus of the duodenum may be filled and overfilled for the study of form, peristalsis, antiperistalsis, and mobility.

This test is then followed by an examination of the stomach filled with a suspension mixture of contrast salt, barium in buttermilk being most commonly used. The examination is then made according to the following scheme:

SCHEME FOR ANALYSIS OF RÖNTGENOLOGICAL EXAMINATION OF GASTROINTESTINAL TRACT.

Study of Filled Stomach.

A. Morphology:
- Type: Hyper, Ortho, Hypo, Subtonic — Its relation to habitus
- Axis
- Size
- Position: Greater curvature, Lesser curvature, Pars pylorica, Antrum — In relation to the mid and interspinous line
- Tone
- Outline
  - Defects
  - Niche
  - Contractures: Temporary, Permanent
  - Spasm: Local, General
- Peristalsis
  - Depth: Length, Height
  - Origin
  - Frequency

B. Mobility:
1. Variation due to posture
2. Variation due to retraction of abdomen or palpation

C. Motility:
Six hours P. C.
Carbohydrate bismuth meal 300 grams
- a. Residue
  - Size
  - Shape
  - Position
- b. Secretion
  - Size and shape of air bubble (fluid level)
  - Kaestle's capsules
- c. Differentiation of pyloric obstruction from spasm
  1. Water test
  2. Papavarine
  3. Atropine

d. Bulbus duodeni
- Shape
- Size
- Outline: Defects; Niche; Contractures; Spasm
- Sphincteric hiatus: Form; Size; Position
- Motility test (duodenum): Residue; Size; Position

On a similar scheme the remaining portions of the gastrointestinal tract are studied.

The examination of the colon may be made either by the ingestion of a contrast meal or the injection of a contrast enema. If by meal, then the examination is made at varying intervals after its ingestion until the colon is empty. A simple form of enema, useful for this purpose, is made by suspending the four ounces of barium in six ounces of mucilage acacia and adding enough warm water to make one and one half pints. The enema is given with a very short rubber tip, at one and one half feet pressure. By palpation and pressure the course of the enema may be traced, the various loops isolated and their morphology and mobility studied. The examination must be made in the vertical as well as the horizontal posture. When motility examinations become important the first examination should be made within four hours after the ingestion of the meal, in order to note the arrival of the meal at the ileocecal junction. The second examination is made six hours after the meal, and subsequent examinations at nine, twelve and eighteen, and twenty-four hours and longer, depending on the necessities of the examination. After a fluid meal the appendix is usually found filled at about the ninth hour, when the ascending colon will have become well filled and the cecum and appendix distended by the filling from the ileum and the antiperistaltic movements which are not infrequently seen traveling from the proximal part of the transverse down to the cecum. This portion of the bowel may be studied systematically according to the following scheme:

- Ileum terminal / Cecum / Appendix
  - Position; Mobility; Content → Posture: Lateral; Trendelenburg
  - Form; Size; Outline

- Ascending / Transverse / Descending
  - Content
  - Position: Distal; Proximal
  - Form (Transverse): No loop; Loop to right; Loop to left; Bilateral loop → Abnormal Looping
  - Outline defect: Permanent; Temporary
  - Haustra: Origin; Large; Small → Regular; Irregular
  - Motility
    1. Small movements or segmental
    2. Haustral or microdiastaltic movements
    3. Mass or megadiastaltic movements
    4. Antiperistalsis
    5. Pendular

- Sigmoid
  - Shape: No loop; Right loop; Left loop; Median loop
  - Size
- Rectum
  - Position
  - Outline
  - Content

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11 EAST SIXTY-EIGHTH STREET.

REFRACTIVE ERRORS CAUSING RETARDATION IN SCHOOL.*

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A considerable number of school children every year in both city and country schools fail to be promoted from grade to grade for various causes. These children are either eliminated entirely from school life or their education is retarded by the necessity of repeating all the lessons of the grade in which they have failed to pass. In New York grammar and high schools some children have the misfortune to be left back a number of times. Such retardation is not only a waste of the taxpayers' money, if preventible, but is a positive detriment to the children, who become discouraged, and take perhaps a more or less intense dislike to school life. Not all truants are incorrigible. Many can be reformed by correction of the physical defects which handicap their efforts to succeed in classroom work. In fact, it is my belief that nine out of ten truants dimly realize the impossibility of keeping up in their classes while so handicapped. To force them to attend school before their physical defects are removed is not only cruelty to the child but a great waste of time and effort for the teacher.

Some years ago Dr. Leonard P. Ayres made a study of the causes of retardation in school and published his findings through the Russell Sage Foundation in a notable book entitled *Laggards in Our Schools*. In that volume Doctor Ayres touches upon defective vision and eye strain as contributing in a marked degree to retardation and elimination of pupils in the public and private schools of all our cities. Since the publication of this work additional study to determine the causes of retardation has been carried on by various investigators, nearly all of whom have laid stress upon its ocular origin in a great proportion of the delinquent children. No child with high refractive error uncorrected by glasses is in proper condition to do the work assigned in school, and for many a child close application to books involves unendurable eye strain. It is a natural consequence that such children either leave school entirely or are retarded year after year through failure to pass their examinations.

When a boy or girl is bright and active on the playground but unable to concentrate his attention

*Read at the Tenth Congress of the American School Hygiene Association, June 9, 1917.

upon his books for any length of time, there is in most cases considerable refractive error present, usually either simple or compound astigmatism or excessive hypermetropia. Properly fitted lenses will correct this refractive error, and will remove the strain upon the ciliary muscle for accommodation for near work, thus enabling the child to do his lessons without a constant effort to maintain visual acuity. Many of these children may have good vision for distance, being far sighted, and teachers and parents may consider the child stupid or lazy when he falls behind in his lessons, not realizing that excellent sight for distance is still consistent with enough astigmatic error to cause a great deal of eye strain for close work. Such children are not to be considered mischievous or bad because they are restless and inattentive in school, nor should they be forced to continue school work without glasses at the sacrifice of irreparable damage to their eyes. In the estimation of one prominent oculist eye strain in childhood may mean neurasthenia in the adult, and many men and women have weak eyes all their days because of unrecognized refractive error during school life.

There is no more practical and beneficent work done anywhere than the medical school inspection by physicians trained to recognize accurately and thoroughly the symptoms of eye strain or than the careful correction, by oculists of wide experience and training, of existing refractive errors with properly fitted lenses. Such correction can not be done accurately by physicians temporarily detailed, however competent in general medical practice, nor should an examination of the eyes of children be rushed in mad zeal for inflated statistics. If an oculist thinks he is only doing his duty when he examines a child's eyes in his office carefully and slowly, taking at least fifteen or twenty minutes before he writes his prescription, surely the helpless children in a public clinic should not be subjected to tests of their eyesight for refractive error entirely completed at the rate of one every five minutes or less. Fortunately children are markedly tolerant of wrongly fitted glasses, and I have seen many a child wearing persistently for months lenses which would drive most adults to distraction in a few days. It is by no means uncommon for the oculists of our children's clinics to find children fitted with lenses for simple myopia when the real diagnosis should have been hypermetropia, and as for astigmatism, in many of these tots that particularly important ocular defect is either entirely overlooked or inaccurately corrected. I am mentioning these facts in the hope that enlightened public opinion may be aroused to the importance of the work now being done for child hygiene in the children's clinics of all our large cities. Too often recalcitrant municipal authorities fail to realize the necessity for adequate provision of competent oculists properly supported if the child in the public schools is to be freed from ocular defects which handicap his efforts to gain an education. Would that our boards of estimate and standardization experts could personally note the remarkable change of attitude toward his lessons when the boy or girl with high refractive error is properly fitted with glasses! The child can now study without headache or blurrings of vision, and his restlessness and inattention pass off to such an extent that some of them make up with ease the grade rank appropriate to their age after being left back. Is not such a result worth while?

In 1897 I had an opportunity to examine the refraction of the eyes in 1,000 school children with particular reference to the detection of astigmatism as shown by the Javal ophthalmometer, which was at that time a comparatively new instrument, having been introduced into this country in 1890 through the example and efforts of my old teacher and friend, the late Dr. D. B. St. John Roosa. From the examination of these children I published some tables of the percentages of refractive error found in their eyes. These tables are based upon children of various ages in two village schools, not only those suspected of ocular defect but all the children in the classes from kindergarten through high school. They thus give a good survey of the refractive errors found in the average school child at that date, although being taken in a village community largely American born, they are not perhaps strictly commensurate with conditions among foreign born or mixed city population. It has been repeatedly shown that refractive errors such as myopia, myopic astigmatism, and mixed astigmatism, are present in a greater proportion of cases and to a higher degree among a foreign born city population than in native American stock of average vitality in a village community.

Table I.

PERCENTAGES OF REFRACTIVE ERROR IN ONE THOUSAND SCHOOL CHILDREN, AGES 5-18 YEARS.

	Per-centage.
Emmetropia	13.00
Hypermetropia	36.20
Compound hypermetropic astigmatism	44.00
Myopia	1.40
Compound myopic astigmatism	3.50
Mixed astigmatism	1.00

Table II.

PERCENTAGES BY AGES OF SAME ONE THOUSAND CHILDREN.

	5 to 8 years.	9 to 12 years.	13 to 18 years.
Emmetropia	10.00	16.43	14.33
Hypermetropia	53.48	37.27	22.87
Compound hypermetropic astigmatism	33.48	40.05	58.55
Myopia	0.87	1.85	1.17
Compound myopic astigmatism	71.74	3.01	5.26
Mixed astigmatism	0.43	1.39	0.88

For extended comment on these statistics I must refer you to my original articles (1). In the second table it will be noticed that the short, immature hypermetropic eye decreases rapidly in percentage as the child develops, being 53.48 per cent. at five to eight years of age and only 22.81 per cent. at thirteen to eighteen years. The stress and strain of school life causing an increased distortion of the eyeball through irregular yielding of its structure is shown in the increase of astigmatism, hypermetropic, mixed, and myopic in nearly equal degree, and myopia itself without astigmatism is found more prevalent in the middle years of school life for the same reasons, although children with much myopia and consequent excessively impaired vision, by dropping out of school in the grammar grades, cause the percentage of high school myopia to be

less than in the middle years of school life. The increase of emmetropia demonstrates the physiological lengthening of the eyeball as the child matures and is again greatest in the middle section of the table.

In contrast with these tables of the refraction of one thousand village school children of all ages it is interesting to compare the refraction found in very young city children before they have been using their eyes in school for any length of time. This present year I had the good fortune to examine the children's eyes in the kindergarten and 1A grades of the Yorkville public school in East Eighty-eighth Street, Borough of Manhattan, New York, which is a large boys' and girls' school in a population of mixed foreign and native born families. The eighty-seven children in this visual survey presented statistics which show the existence of refractive errors and abnormalities of sight even at that tender age, although it is encouraging to note that these refractive errors do not occur in so great a percentage or to so high a degree as in later years. The comparison of these two sets of statistics quite clearly demonstrates that many of these refractive errors are increased in degree where present, and when absent can be caused directly by the stress and strain of the use of the eyes in school.

These young children of kindergarten and 1A grades were very carefully examined both with the ophthalmoscope and the shadow test (skiascopy), and in addition their vision was taken subjectively, although in such young children, five to seven years old, objective methods were more relied upon, since children at these ages can rarely be trusted to answer accurately questions involving visual judgment. Years ago Doctor Roosa's associate, the late Doctor Ely, demonstrated that the normal baby is born farsighted, which merely represents the too short eyeball of immaturity, and so I was not surprised to find that ninety-one per cent. of these children were more or less hypermetropic. As bearing out my contention for over twenty years that myopia is always abnormal and means an eye elongated and weakened by local or constitutional disease or dyscrasia, only 1.1 per cent. of these little children could be proved to have any myopia at all. The myopia of later years is merely to be laid at the door of the strain of school life, and should in most cases be entirely preventable through early and accurate correction with glasses of whatever refractive error originally exists. If we remove the eye strain caused by the efforts of the ciliary muscle to compensate for defective vision due to high refractive error, we can often prevent the yielding of the tissues of the eyeball which results in the distortion of structure constituting myopia. A weakened eyeball elongates through the turnstile of astigmatism into myopia more easily in the undeveloped and plastic years of early childhood than in adult life. Few cases of high myopia due to functional overstrain and not to constitutional or local disease develop after school years are safely passed.

That vague term emmetropia, meaning an eye optically without structural defect so that the rays of light are focused perfectly on the retina, was discovered in only 2.4 per cent. of the cases. This seems to bear out the contention of George M. Gould that there is practically no such thing in civilized man as an eye without some hypermetropia, myopia, or astigmatism, and that the more careful and accurate our examination the rarer the optically perfect eye becomes. Astigmatism is not easily demonstrable in these little children with the ophthalmometer, as they cannot usually hold their eyes still enough for its accurate reading, but at least fifteen per cent. of them were surely astigmatic to a greater or less degree with the shadow test. Vision was surprisingly good in nearly all of these children, seventy-seven per cent. of them reading 20/15 Snellen test type with ease at twenty feet. In eighty-seven per cent. vision was approximately equal in both eyes, but in thirteen per cent. the right eye had the better sight. Thus early in life the right eye is the dominant eye. The 5.75 per cent. of cases of convergent squint all carried out Gould's theory of right eyedness of the human race, all of these children having the right eye turn in by preference and fixing objects with the dominant right eye. In twenty-three per cent. of these children the refractive error was sufficient for me to prescribe glasses, the other sixty-seven per cent. being without symptoms of eye strain and not having any great amount of ocular defect were left without glasses. I regret to note that a considerable proportion of those for whom glasses were prescribed failed to get them, owing possibly to a lack of appreciation of the need of wearing glasses on the part of the parents of these children, although by the insistent advice of the oculist and school nurse the most urgent cases were supplied.

In conclusion I wish to emphasize the following statements as a summary:

1. Retardation in school has as one of its principal causes the existence of refractive errors in the eyes of the school children. As Doctor Ingalls has said: "It is a waste of time to send a child to school when his eyes are not in proper condition to do the work assigned."

2. Children are born hypermetropic if normal, and the excessively short eye in adult life is an eye which has not lengthened in axis as the child matures. Most adults are, however, somewhat hypermetropic, since emmetropia, or the optically perfect eye is rare. A moderate degree of hypermetropia can be considered almost physiological in civilized man.

3. The myopic eye is always an eye structurally weak, if not diseased, and prolonged use of the myopic eye in childhood, especially if uncorrected by glasses, will surely result in increase of the myopia and consequent diminution of vision. As the eyeball grows in strength and vitality, this functional myopia increase tends to stop, and for this reason few adults whose eyes are not actually diseased are any more nearsighted at fifty than at twenty years of age.

4. Astigmatism of all varieties represents an irregular yielding or distortion of the eyeball, by which the eyeball has different radii of curvature in different axes. Corneal astigmatism is believed by most authorities to be due to pressure of the

lids in prenatal life on the plastic eyeball of the infant, but my belief, backed up by these statistics is that it is rarely congenital, if the child is born normal, and is directly caused by the stress and strain of near work in school in the great majority of instances.

5. Of these refractive errors, astigmatism either with or without hypermetropia is a prolific cause of headaches and eye strain, while marked hypermetropia is very apt to cause decided asthenopia for near use of the eyes; myopia does not usually give any particular subjective symptoms of eye strain, although it causes considerable decrease of visual acuity for distance, and so may interfere markedly with the duties of school life.

6. The symptoms and physical signs of eye strain can be easily recognized by the trained observer, and there is no more brilliant success in school hygiene than the results in improving the eyesight and in relieving eye strain which follow proper correction of refractive error in children.

This work in order to do justice to these immature and helpless wards of the educational and health departments of our government should be performed by oculists of wide experience and training who can bring to the public service devotion and ability equal to their task.

REFERENCE.

1. CARHART: New York Medical Journal, April 17, 1897; June 12, 1897.

616 Madison Avenue.

A PARAFFIN WAX TREATMENT FOR BURNS.

By Charles Augustus Behney, A. B., M. D.,
Philadelphia.

During the summer of 1916 extraordinary reports reached America regarding a new remedy used in France for the treatment of burns. This substance, the now well known ambrine, was discovered and commercialized by Barthe de Sandfort, who is carefully guarding the formula of the preparation. A company has been formed for its exploitation and it is placed on the market at three dollars a pound, a price which prohibits its general use. The substance is brown in color, waxy in appearance and consistency, and has an odor somewhat resembling crude petroleum. When heated it becomes a liquid which is clear brown in color. This, upon cooling, solidifies at 43° C., and when painted on the body quickly hardens into a thin film, which adheres to the skin and is malleable and slightly flexible. It is maintained that this dressing, 1, gives greater immediate relief than any dressing heretofore employed on burns; 2, is more comfortable; 3, is painless on removal; 4, hastens healing and permits the healing of large areas without grafting; 5, permits healing to take place with less scar formation and fewer contractures.

Believing that an efficacious substitute could be found, I undertook to determine a combination which would be simple, cheap, and satisfactory. No effort was made to analyze the original ambrine, but a study of the problem showed that the following properties were the essentials of such a dressing: 1, bland and nonirritant; 2, impermeable to air, moisture, and heat; 3, melting point slightly above body temperature; 4, flexible; 5, adhesive to the sound skin; 6, nonadhesive to granulating surfaces; 7, unaltered in composition by heat; 8, favoring epithelial proliferation. Many trials of various materials in different proportions were made before the following formula was finally adopted as best fulfilling these requirements:[1]

Paraffin (M. P. 40° C.), ...87 per cent.
Beeswax (yellow), ...10 per cent.
White resin (turpentine), ... 3 per cent.

Paraffin is a convenient base, can be secured at almost any desired melting point, and in itself possesses most of the desired properties as outlined. The wax is added to make the mixture more malleable. The resin renders it adhesive and elastic and is reputed to stimulate epithelium. When melted this mixture solidifies at 45° C. The cost of this mixture is approximately fifteen cents per pound. In preparing the material, the resin is heated to melting. To this is slowly added the wax and finally the paraffin, maintaining constantly a temperature above the melting point of the resin. When the mixture becomes clear it is poured through fine gauze into convenient sized sterile pans and allowed to cool. When a deodorant is desired betanaphthol 0.5 to one per cent. can be incorporated. Eucalyptol or oil of pine can be added after the liquid is partially cooled. The dressing as outlined by De Sandfort consists of three layers: 1, a layer of the waxy substance directly upon the burned surface; 2, a thin layer of absorbent cotton; 3, a second layer of wax which, while still hot, penetrates the cotton and fuses with the first layer and both unite into one solid sheet of wax reinforced by the cotton.

In our cases the following technic has been followed: The lesion is thoroughly cleansed by irrigation with sterile water or normal salt solution and then dried. Drying is best accomplished by the use of a patent hair dryer, though this is not essential. The application of the first layer of wax is made with a soft camel's hair brush or an atomizer. The application of the wax should extend for about an inch beyond the margins of the lesion on all sides. The thinnest layer of absorbent cotton obtainable, or gauze, is now placed over the wax. The second layer of wax is applied with a brush so that it completely saturates the cotton and firmly seals down the margins of the dressing to the sound skin. For additional protection a heavy layer of raw cotton is usually placed over all and the dressing maintained by means of a gauze bandage. The best results are obtained by redressing every twenty-four hours.

For a period of time there will be active suppuration underneath the dressing. This need not cause alarm, since it soon subsides and does not cause sepsis. With one exception, a case complicated by an abortion, retained secundines, and pneumonia, not a single case showed symptoms of septic absorption. While many of the cases showed albumin and a few casts in the urine, there were never signs of severe

[1]Since these observations were made and while clinical tests of our preparation were being carried out, a number of formulæ have been published in recent numbers of the *British Medical Journal* and the *Journal of the American Medical Association*. Many of these formulæ are no doubt good and deserve trial.

renal involvement. With the disappearance of the devitalized tissues, the granulations become vigorous and healthy. Properly managed they should not become annoyingly exuberant. If for any reason they demand it, they are best controlled by firm pressure. Silver nitrate should never be used if it can be avoided. Early in our study of this treatment it was employed and these cases are the only ones which do not show everywhere smooth and flexible regeneration of the epidermis.

Where the destruction of tissue overlies a joint, the limb should be dressed in extension and exercise begun early. Exercise even while the dressing is in position is not painful. Healing under this treatment is far more rapid than with any other method; yet, unless there remain numerous islands of epithelium in the midst of the burned area from which the new skin can regenerate, the process of healing requires considerable time in extensive burns. It seems therefore advisable to graft by the Thiersch method as soon as the granulations are in condition to permit it, usually in about three weeks. After the grafts have become firmly established the paraffin wax dressing is resumed.

Comparison was made with ambrine by dressing adjacent parts of burns on the same individual with the two preparations and it was impossible to find a single feature in which ambrine was superior to the paraffin wax dressing. This dressing was employed in thirteen cases of second and third degree burns at the University and Presbyterian Hospitals and at the Dispensary of the University House with highly gratifying results. It was also applied in cases of burns at the Chester Hospital, following the recent disaster at Eddystone, and the effectiveness of the dressings here also measured up to our expectations.

CONCLUSIONS.

1. A preparation of paraffin, wax, and resin is as good as ambrine and comparatively inexpensive.
2. Applied as outlined it makes a comfortable dressing which can be removed without causing pain.
3. It relieves pain and diminishes shock.
4. It enables the patient to become ambulatory earlier.
5. It lessens toxic absorption from burns involving large areas and does not cause sepsis.
6. It promotes the separation of the devitalized tissues.
7. It minimizes the formation of scars and contractures.
8. It should be applied as soon as possible for the first dressing and should be used for all subsequent dressings.
9. After healthy granulations have been obtained it is advisable to hasten epidermal proliferation by grafting.
10. The use of silver nitrate is always undesirable.

2601 LOMBARD STREET.

Treatment of Diphtheria.—A. D. Pattello (*Texas Medical Journal*, June, 1917) prefers an initial dose of 10,000 units where the patient is three or four years old. It is best administered intravenously. If this can not be done, it should be given intramuscularly.

ETIOLOGY AND TREATMENT OF BRONCHIAL ASTHMA.

BY MARK J. GOTTLIEB, M. D.,
New York,
Director of the Laboratory for Clinical Research.

Bronchial asthma is a disease characterized by paroxysms of coughing, wheezing, dyspnea, cyanosis, and in some cases expectoration of frothy or thick yellow and often profuse sputum. The underlying cause is to our mind an anaphylaxis frequently complicated by an infection of the bronchial mucous membrane. From the evidence at hand, it is more than probable that the primary cause of bronchial asthma is a sensitization to one or more of the proteins, either animal or vegetable. To substantiate the assertion we have the following parallelism of asthma to anaphylaxis which cannot be denied. The majority of people who are subject to anaphylaxis have shortness of breath and cyanosis at some time during their attack; either of these symptoms is ameliorated in a very short time after the administration of adrenalin and when the sensitizing substance is removed or not applied, the symptoms do not occur. The bronchial symptoms in both instances are very often associated with urticaria, erythema or eczema; and last, but not least, upon administration of the antigen in a larger dose than usual to a sensitive individual typical attacks of bronchial asthma lasting from one half to two hours, have been produced by the author upon several occasions.

The substances most common in the production of this allergy are the excreta and the emanations of horses, cats, and other animals and insects; the pollen of anemophylous plants; certain foods, especially egg white, bologna, fish, tomatoes, apples, cheese, and strawberries; and finally the proteins of bacteria. In a great many cases where a primary sensitizing factor cannot be found, it may be assumed that the protein derived from the disintegrating bodies of the infecting agent plays that important rôle. For this hypothesis adequate proof is still wanting. In February, 1914, the writer attempted to determine whether a certain patient who was suffering with asthma had an allergy to pneumococci or streptococci which were found in his sputum. To this end, the bacteriologist was instructed to make bacterial extracts of the respective organisms. Skin scarifications were made on the patient's arm and the extract rubbed in; a distinct reaction occurred from the streptococci but, unfortunately, the extract was made with glycerin, and it was decided the reaction was due to that, and not to the specific action of the organism extract. Recently Goodale has shown that reaction to bacterial extracts occurs within fifteen minutes in sensitive individuals and it bids fair to open up a new and broad field in the therapeutics of these ill understood conditions. Of the thirty-seven cases of bronchial asthma studied by us six were tested with a variety of proteins with the following results: two reacted to horse serum; one to horse serum and tomato extract; one to egg white; one to potato, and another reacted to ragweed pollen. Of 164 cases of hay fever, the histories of which have been re-

viewed by the writer, seventy-five had asthmatic symptoms during their attacks of pollinosis. This fact emphasizes our previous assertion that the basis of asthma is an anaphylaxis. Many of these cases have asthma throughout the year due to a superimposed infection.

The secondary etiological factor is bacterial infection of the bronchial mucous membranes; the most common among these are members of the diplostreptococcus group. Other organisms, such as Micrococcus tetragenus, Diplococcus catarrhalis, staphylococcus, and influenza bacillus, are occasionally found, but it appears that these are only contributory factors.

The source of the infection is varied. Naturally, the upper respiratory tract offers the most accessible path through which infection can travel to the bronchial tree. Chronic infections of the nasal accessory sinuses are the most common foci and very often run pari passu with bronchial asthma. Next in order are chronic cryptic tonsillitis, tooth and alveolar infections, chronic cholecystitis, and appendicitis. The above mentioned nidi for infection are the most common, but an infection in any part of the body may transmit organisms by the blood-stream to the bronchial mucous membrane. It is a curious fact that bronchial asthma has occasionally apparently been cured by the removal of a diseased gallbladder or appendix. Of the thirty-seven cases which we have studied the organisms cultured from the sputum were as follows: seven, streptococcus; eight, pneumococcus; seventeen, streptococcus and pneumococcus; two, pneumococcus and staphylococcus; one, pneumococcus and Diplococcus catarrhalis; one, pneumococcus, streptococcus, and staphylococcus; one, pneumococcus, Micrococcus tetragenus, and influenza bacillus. In this group of thirty-seven cases, there were twenty-six males and eleven females, making the incidence of the disease in the sexes twice as frequent in males as in females. The ages of these cases occurred in the various decades as follows: two in the first; two in the second; four in the third; nine in the fourth; fourteen in the fifth; four in the sixth, and two in the seventh respectively. The youngest patient was six years and the oldest was sixty-four years of age. Naturally the age was recorded at the time the patient first came for treatment, although he or she may have suffered with this condition for many years, therefore the age as given is no indication of the age at which this disease is most frequently acquired. In the majority of these cases, heredity plays a very important rôle. Almost every history, if studied carefully, will reveal in either the direct or collateral branches of the family some allied ailment.

From the foregoing data, one can formulate the natural history of a case of asthma descriptively as follows: Given an infant, whose family history contains manifestations of anaphylaxis such as hay fever, asthma, urticaria, eczema, or erythema. This child becomes ill with some intestinal disorder and in the course of treatment, a weak solution of egg white is administered a few times. The child recovers and does not partake of egg albumen until such time as it is considered a suitable diet for his age. At the time of the first exhibition the child is sensitized, and at the second, symptoms of anaphylaxis appear in the form of a severe gastroenteritis, spasmodic asthma, urticaria, or eczema. The parents imagine that the child was poisoned with something other than egg; from this time on whenever egg is exhibited, symptoms occur, and finally an infection of the nasal accessory sinuses and bronchi supervenes, and when egg is again exhibited the typical clinical picture of bronchial asthma may become manifest.

The most effective method of eradicating this disease and ailments akin to it, is a campaign for the education of the public in its prevention. Once an article of diet has been given to an infant or child, it should be administered continuously thereafter, because if a food is once given and not taken months or years afterwards there is danger of sensitization especially if there is a family history of asthma, eczema, urticaria, erythema, or hay fever. Infection of any sort should be speedily and efficaciously dealt with, particularly infections in cavities where drainage is never complete, because of the anatomical arrangement of the parts. Prominent among these are the nasal accessory sinuses, tooth sockets, gallbladder, and appendix.

The determination of the etiological factor, other than the bronchial infection is not easy and should be undertaken with the thoroughness of a research in each case. All possible foci of absorption should be thoroughly investigated. The nose should be examined for infected sinuses, the teeth x rayed so as to display possible alveolar abscesses, and the history of a gallbladder or appendix infection should be carefully considered, and if found a possible cause, be attacked surgically at the earliest possible date. The foods which most commonly cause anaphylaxis should then be considered. We are in the habit of taking the fresh food, crushing it in a mortar, and triturating it with 8.5 per cent. sodium chloride solution in sufficient quantity to make a thick suspension which is then strained through several thicknesses of cheesecloth. This is sterilized at 55° C. for one hour each day until found sterile, and is used as a stock solution from which dilutions are made according to the demand. In case of liquid foods and serums, they are diluted directly with 0.85 per cent. sodium chloride and used as such. These antigens are injected intracutaneously to determine to which the patient is allergic. The patient is also tested with pollens. If the patient is anaphylactic to food substances which can be left out of the diet, he is instructed not to partake of them, but if he is sensitive to the dust of horses, casein, or the inexorable egg, treatment is instituted with the idea of disensitizing the patient by the administration of gradually increasing doses of the antigen. The sputum is cultured to determine which organism or organisms are present, and if any of the diplostreptococcus group are found, an autogenous vaccine is prepared and administered for the purpose of combating the infection.

RESULTS.

Twenty-seven of the thirty-seven patients whom we have had under our care had distinct nasal factors

which were corrected and in addition autogenous vaccines were administered. Seven had two series of injections each consisting of fifteen doses. Five have been free from symptoms over four years, thirteen for over two years, and nine had a return of their symptoms but they have stated that the attacks were not as severe or so frequent as before treatment. Ten patients were not benefited.

CONCLUSIONS.

1. Bronchial asthma has always an underlying anaphylaxis.
2. The cause of the anaphylaxis is not the same in every case.
3. The anaphylaxis may be multiple.
4. In the majority of cases there is a superadded infection.
5. The nasal accessory sinuses are the most important avenues through which infection occurs.
6. Bronchial asthma is curable if the etiological factors are found and dealt with accordingly.

I wish to express my thanks to Dr. Seymour Oppenheimer for his cooperation in this work and for the privilege of observing many of these cases occurring in his practice, and for the opportunity of studying his case histories of asthma and pollinosis.

45 EAST SIXTIETH STREET.

RACE RETROGRESSION.

By ROBERT H. MACNAIR, M. D.,
Springfield, Mass.

If we would be guided by historical records of Scripture it is impressive to note that in the ancient Hebrew tribes sterility was invariably considered a severe curse in the family. It was recorded that in the prolific family circle of Jacob when Rachel became sterile for a time she cried out to her good husband, "Give me children or I die." There also seemed to be not a little jealous rivalry between Rachel and Leah in bringing forth sons. A little further back good Abraham prayed to the Lord that the barren womb might conceive, even though his wife was past the child bearing period. Later, Samuel's mother even made a vow to the Lord, that if she should be blessed with a son he should be literally given to the holy service in the temple. On down through the ages the progress of this natural function of man can be traced, until the period of advanced Christian civilization. From the retrospective consideration of the important process of race propagation, let us look into conditions along the same line applying to the modern era of the world's humanity.

If there was progress in propagation among ancient generations, assuredly the conclusion is obvious that the situation today must be termed retrogression, a process directly opposed to progress. While we may not be willing to admit that intellectually or physically we are undergoing retrograde metamorphosis, we are most assuredly face to face with the fact that, instead of bewailing the ill fate of sterility as did the Hebrew mothers, the young woman of today too frequently bewails the misfortune of bringing forth an heir. It would seem that sociologists and other scientists have adduced a number of reasons for such an unnatural state of modern society. It might be argued upon the basis of the very high cost of living; it may not seem wise to bring more mouths into the world to feed or more little bodies to clothe, with young minds to educate, etc. However, while various arguments are being formulated, good Dame Nature is crying out against another outrage by modern man; the highest product of her handiwork is doing most to obstruct her work by direct violation of natural laws.

The suggestion may be offered at a venture, by way of formulating another reason for this violation, that the serious cause may be found in man's disinclination to acknowledge one of the most universal natural laws, viz., the law of compensation. It has been handed down since the very dawn of creation as an immutable rule that there are offsets to everything that man may conceive of as an attractive advantage. Every advantage has its disadvantages; there are also many blessings in disguise. One interesting instance is recalled that may serve as an illustration of the compensation that came—it was also termed retribution—to an apparently normal couple that for a number of years seemed directly to thwart Nature's course. The evidence in this case came from authentic sources and indicated that a healthy, vigorous young couple fought against natural function for a number of years. Finally, however, it was concluded that an offspring would add to the happiness of the couple —to comfort their declining years, probably. In due time the offspring came. It was a son. He developed physically but not mentally until a period of growth was reached when it was determined that he was an idiot. In that case we might say there was compensation with a vengeance, even though it might have been argued that the case was a mere coincidence. A number of coincidences might be added to this in connection with the same violation of natural laws from the working experiences of many modern gynecologists. The records may possibly indicate that not a little organic and serious functional trouble directly results from the frequent obstruction of Nature's work.

If the propaganda of scientific birth control would act as a preventive of such serious after-troubles, there may be much benefit from substitutions of a lesser for a greater evil. But then, in line with that same widely applied law of compensation, the business of the good gynecologist would most assuredly suffer. In this section of the country, the New England of steady habits—when the Puritan was here—large families became such prize rarities that one good farmer and his wife with a round dozen husky children, many of whom it was my privilege to welcome first into a strange and so called cold world, sent a photograph to a President of the United States, one who was a vigorous exponent of the large family group. The proud parents received an autographed letter of thanks and congratulation.

Unquestionably there are social causes that produce effects to render very many prospective mothers unfit for the natural function of child bearing.

However, there are precious few that could not in time be eliminated by a stricter conformity to natural life requirements in the growing and developing prospective mother. It would doubtless be worth the elimination of an enormous pile of modern conventional rubbish if by conforming to the simple requirements of a wholesome natural life more of the physical strength and vigor with less of the tendency to sin against a most generous nature, could be developed into the race of modern man. How, may we ask, will modern birth control bring about an improvement in a social question that other scientists than the gynecologist have spent considerable time and labor upon? One set of workers, the sociologists, have endeavored to bring about measures to prevent a social evil, while the gynecologists have labored to correct abnormalities that too frequently result directly from violations against nature. When the normal fetus is allowed to develop *in utero* to term and succeeds in making its safe entrée to the world toward which it was directed *nolens volens*, whether from other conventional rules or otherwise, natural lactation fails and the ever convenient nursing bottle is resorted to, by such unnatural feeding, for normal growth and development, many victims come under the care of another line of medical scientists—the pediatrists. It must seem logical that, under such substitution for nature's plan of feeding, there must result inevitably a process of deterioration in both the physical and mental organism in the succeeding generations. Most frequently during the entire period of what should be natural lactation, the anxious mother is kept under a constant strain of anxiety which in time reacts disastrously upon the sensitive nervous system. Then, too frequently also, the long list of neurasthenics is again added to. The above suggested causes with clearly apparent effects are so prevalent that a simple allusion to them is sufficient.

To indicate the one and only true remedy would seem exceedingly simple; however, its simplicity must assuredly be the stumbling block to its universal application. The reason may be found in the fact that modern conventionality does not countenance simple, natural life methods, not as an every day working formula, as the good Dame Nature does. We might contend that it would be vastly better and more sensible to serve the very best interest of the race of man by conforming to the simple rules of growth, development, and usefulness in the temporal life. The latter course would also insure more natural and lasting happiness than for modern, progressive humanity to be aping sticklers of conventionality. But what is to be gained by contending anything different from that which appeals most fascinatingly to the faddy, changing fancy of modern, Christian civilization?

There seems to be a constant attraction in new things, possibly because we live in an exceedingly faddy era. It may also be due to the fact that we are so very progressive along almost every line. It has been thought that one of the reasons why history repeats itself with such unerring regularity, is because of the constant and repeated violation of natural laws.

423 Main Street.

A CASE OF BLINDNESS AND FOCAL INFECTION DUE TO ETHMOIDITIS: CURED.*

By Harry Rodman, M. D.,
New York.

This case illustrates not only the necessity of studying the accessory sinuses and the nasal chambers in all ocular disturbances, but also the importance of searching for a focus of infection in all cases of rheumatism and in joint affections principally. At the Hospital for Deformities and Joint Diseases, we consider it a matter of routine to make an x ray examination of the teeth and gums, to examine the tonsils carefully macroscopically and biologically, and to x ray the sinuses, if symptoms at all warrant it, in every case of rheumatic and other joint conditions, as well as to search for other foci in the genitourinary and intestinal tract, etc. We have, consequently, drawn some very interesting conclusions. The close relationship of joint diseases to focal infection has been known for a long time through clinical histories and symptoms, but only lately has this theory been demonstrated scientifically in medical literature. I shall, however, leave such details to pathologists and shall relate the following history:

Case.—Louis N., aged twenty-three years; occupation, clothing cutter. Family history negative. No tuberculosis, no gonorrhea, no syphilis. He has always been in good health with the exception of a chronic nasopharyngitis with a discharge from the nose as long as he can remember. The present history dates back eight months, when he began to complain of pains in the left orbitomaxillary region and over the region of the left ethmoid extending to the eyeball. He was treated palliatively by his private physician, but the pains increased in severity and vision in his left eye began to fail, until he became blind in that eye. Joints and muscles, large and small, were involved secondary to the focal infection of his ethmoiditis. He had received treatment at various clinics for rheumatism. He became a patient of our hospital a month ago and was referred to my department. He then was suffering with total loss of vision in his left eye and acute general involvement of joints and muscles, particularly of both knee joints. We examined the nares and found the left side entirely blocked with a deflection of the septum high up, the middle turbinate completely occluding the middle meatus and wedged up tightly against the septum. After using astringents, we were able to shrink the middle turbinate and found pus exuding from above and below the turbinate, showing sinus involvement. An x ray examination demonstrated positively a empyema of his left ethmoid. On February 19th I removed his middle turbinate at one sitting. One week later I removed the anterior and posterior ethmoid cells, and within one week his orbital pains disappeared; his joint disturbances improved markedly, and most important of all, his vision became clearer, until at the present date it is almost normal.

On March 16th I performed a submucous resection of his nasal septum, and with the exception of some slight pains in his left knee joint at present, for which he is receiving treatment, he is entirely cured. On July 1st, when I saw him last, his vision was perfectly normal and no further evidence of joint involvement was present.

The conclusions to be drawn from this case then are to investigate carefully and to search diligently for a focus if infection in every case of arthritis and rheumatic lesions, and to examine the nares and accessory nasal sinuses in all ocular disturbances.

780 West End Avenue.

*Case presented at a meeting at the Hospital for Deformities and Joint Diseases, March 27, 1917.

Medicine and Surgery in the Army and Navy

THE MEDICAL DEPARTMENT OF THE UNITED STATES ARMY.*

First Communication: General Organization of the Army.

By William W. Reno, A. M., M. D.,
Major, Medical Corps, U. S. Army.

The land forces of the United States consist of the regular army, the organized land militia—National Guard—and such volunteer forces as Congress may authorize. The conscripted forces become for the time being a part of the regular army. The land forces are grouped under two general heads: the coast artillery and the mobile army. The coast artillery is charged with the care and use of the fixed and movable elements of coast fortifications, including submarine, mine, and torpedo defense, as they apply to coast defense. The mobile army is the great offensive fighting branch. Coast artillery is essentially defensive. The mobile army is organized for offensive operations against an enemy, and on this account requires a maximum mobility. The basis of organization of the mobile army is the division. A division of troops is a selfcontained unit made up of all necessary arms and services, and complete within itself with every requirement for independent action incident to its ordinary operations. When several divisions operate together they constitute an army corps. Two or more corps constitute an army. A line of communications is established for each important force about to engage in field operations of an extensive character. In general the line of communications is the connecting link between the fighting force and the base of supplies. Along this line all sorts of supplies pass forward—principally men, food, ammunition, guns and other offensive weapons, and medical supplies. Toward the rear the principal traffic is empty supply wagons, trucks and other vehicles, and ambulances carrying wounded.

In time of war the activities of the military establishment embrace, 1, the service of the interior, and 2, the service of the theatre of operations.

THE SERVICE OF THE INTERIOR.

The service of the interior is carried on by the bureau chiefs of the War Department and department commanders. The bureau chiefs are the technical advisors of the Secretary of War and chief of staff. They are kept informed of the plans of the field forces and recommend the steps to be taken to insure the successful execution of these plans, as far as their respective departments are concerned. The bureau chiefs are the adjutant general, the inspector general, the judge advocate general, the quartermaster general, the surgeon general, the chief of ordnance, the chief of engineers, and the chief signal officer. They are all stationed in Washington, D. C., and coordinate the duties in their respective departments. They are directly responsible for the efficient operation of the general depots of supply, general hospitals, arsenals, and other military establishments placed under their orders. They are charged with the accumulation of the necessary supplies and material and with forwarding the same in accordance with regulations to the point where they come under the control of the department commander, the commander of the field forces, the commander of the port of embarkation, and in certain instances the commander of a concentration camp. They formulate estimates for the necessary appropriations to carry on the operations of their respective departments or corps.

The department commander is responsible for the recruitment, training, and equipment of all military forces not specially excepted within the limits of his department, and for their mobilization and dispatch to concentration camps. He is advised by the War Department where troops of his command are to be sent, the time at which they should arrive, and the commander to whom they should report. He is responsible for their movement, transportation, and supply while en route. He sees to it that adequate records of physical examinations are prepared and that all men going forward to the theatre of operations are protected by the prescribed prophylactic treatments. He keeps the War Department informed of the state of preparedness of the troops under his command. He is responsible for the defense of all portions of his department except where an independent commander has been assigned by War Department orders. In this latter case the responsibility of the department commander does not extend to the area of operations of the independent commander.

The general staff is a body of officers especially selected to assist the Secretary of War in the supervision of all branches of the military service with a view to their coordination and harmonious cooperation in the execution of authorized military policies. The head of the general staff is called the chief of staff. The general staff is also charged with the duty of preparing plans for the national defense and for the mobilization of the military forces, the collection of military information of foreign countries and of our own, the preparation of plans of campaigns, battles, engagements, and expeditions overseas and elsewhere, and the preparation of war diaries or a history of campaigns. Some of the officers of the general staff are also assigned to duty with commanders of armies, corps, divisions, and territorial departments. These are collectively called general staff serving with troops. Those not so assigned are under the immediate direction of the chief of staff in Washington and are called the War Department general staff. All the President's commands with regard to the army are given through the Secretary of War and the chief of staff.

THE SERVICE OF THE THEATRE OF OPERATIONS.

In the theatre of operations the functions of the War Department and of the various commanders are, in general, as follows: The War Department designates the commander of the field forces, as-

*This is the first of a series of articles which will appear in the Journal on this subject.

signs him a definite mission, prescribes the zone under his command, and supplies him with the means necessary to the accomplishment of his mission. The commander of the field forces exercises supreme authority over all military and administrative matters within the zone assigned him, organizing the means placed at his disposal so as to insure efficiency, and directing and controlling all operations necessary to the accomplishment of his mission. The commander of the line of communications is responsible to the commander of the field forces for the efficient operation and defense of the line of communications and directs and controls all administrative and staff services attached thereto. All military units larger than a company have headquarters and staffs. The headquarters of squadrons, battalions, and brigades have no administrative functions. The headquarters of an independent detachment has for the time being administrative functions and during such periods is temporarily assigned an administrative staff. The commander of an army concerns himself with only the broad questions of strategy and military policy. He assigns general missions to his subordinate commanders and leaves them to work out the necessary details. On this account he is assigned only such administrative and technical staff as he may require for these broad functions.

The staff functions of the headquarters of units larger than a brigade may be separated into two groups: 1, general staff group, and 2, a technical and administrative group—record, inspection, law, supply, sanitary, engineer, ordnance, and signal. On the general staff the chief of staff is the mouthpiece of his commander and should enjoy his complete confidence and a considerable degree of independence in the performance of his duties. He controls and coordinates the operations of the troops and all administrative and technical services under the orders of his commander. He is provided with such assistants as are necessary. To each such assistant is particularly assigned the work of one or more of the three general divisions of general staff work, viz.: The first, or combat, section concerns itself with orders, movements, and dispositions of the forces; combats, detachments; war diaries. The second, or administrative, section concerns itself with organization, losses, reinforcements, police, and discipline; questions of supplies of all kinds; signal and telegraph service; evacuation and care of sick and wounded; relations with the line of communication and all general correspondence. The third, or intelligence, section concerns itself with the movements and dispositions of the enemy, including exploration, reconnaissance, and the gathering and distribution of information; interpreters, newspaper correspondents, and various agents; relations with the enemy, flags of truce, deserters, and prisoners of war; relations with the civil authorities of the occupied territory, requisitions, etc.

The technical and administratve staff includes the representative of the various staff corps and departments who may be assigned to the headquarters. These officers perform the duties appropriate to their office under the instructions of their commander. During the period of grand tactical operations with commands larger than a division and when a line of communication is in operation, their functions are advisory. Upon completion of the grand tactical operations and upon the discontinuance of an organized line of communications, or if no line of communications has been organized, these staff officers assume a more immediate control of their respective staff personnel, depots, hospitals, etc. The functions of the technical and administrative staff of a division are so intimately connected with the maintenance of the division as to preclude the separation of any of its personnel for any extended period of time from its headquarters. These staff officers are the technical advisers of the division commander, and control directly the operation of such portions of their respective corps personnel as may be placed under their immediate orders.

The commander of the line of communications reports directly to the commander of the field forces. The mission of the tactical units and administrative groups assigned to a line of communications is to relieve the combatant field force, as far as possible, from every consideration except that of defeating the enemy. It is necessary that the commander of the field forces be relieved from the consideration of details and thus be free to consider the broad lines of action to be followed by his command. Therefore, a force of considerable size, especially one composed of all mobile arms, operating independently against an enemy, should ordinarily establish a line of communications. Lines of communication will be more or less elaborate depending upon conditions such as the strength of the force and its mission; the length of the line; the terrain; character of the operations.

COMMENT ON EXEMPTION BOARDS.

By J. Milton Mabbott, M. D.,
New York,
Member of Local Board for Division No. 154, New York City.

Origin and organization.—The public, through various sources of information, and particularly through the influence of the newspapers, has adopted certain terms in relation to the draft of men for the war of the United States against Germany which serve a useful purpose. By common consent, we are all speaking of "exemption" and "exemption boards." Under the authority vested in him by act of Congress, approved May 18, 1917, the President of the United States, through the War Department and supplementary channels, caused the registration of the young men of the country in upward of 4,000 separate areas, each containing, roughly speaking, about thirty thousand inhabitants. Each of these areas is technically known as a division. In New York City, such an area represents approximately one half of an assembly district. There is a tendency to call the local division an "exemption district," but the word district should be reserved technically for much larger application. A single district comprises all the divisions on Manhattan Island, formerly constituting the city and county of New York.

Method of selection and duties of members of local boards and medical examiners.—The law provides that certain men who registered in each area should be entitled to exemption from the draft. This would naturally exclude German aliens, American citizens already enlisted in the army, and any man physically unfit for service. In addition to these it was deemed practicable to excuse, among others, those men who are the sole or chief support of wife, child, aged and infirm parent, or dependent brother or sister under the age of sixteen years. How should it be determined who were entitled to exemption? We understand that Congress assumed that three representative citizens, residing in or near each area and organized as a local board for the purpose, would be able to render first judgment in such cases in a satisfactory manner. The combination of a doctor, a lawyer, and a layman has always been looked upon as ideal where medical, legal, and civic questions were involved. And in so far as it was feasible, most of the exemption boards were so constituted by appointment of the President. After accepting the appointment and taking the oath of office, these three men, or two of them, met and organized by electing a chairman and clerk, or secretary, and thus became qualified to proceed as "Local Board for Division No. ....." That is the legal designation of an exemption board.

The regulations provided that unless there were objections, the doctor of the board was expected to assume charge of the physical examination of all persons called for service under the selective draft. If the doctor, for good and sufficient reasons, declined to serve in this capacity, he could still serve on the board which would then appoint a medical examiner. It happened that on certain boards there were two physicians and on at least one board in New York City all three members are doctors; this happened, it is said, because among the names submitted to the President, representatives of the community had failed to nominate other citizens who seemed equally qualified. This board decided for itself which should be its medical examiner.

How the appointments were made seems to have caused a tempest in a teapot, here and there, with talk of politics and even medical politics! I feel free to say, on information and belief, that so far as the Borough of Manhattan is concerned, the plums were not eagerly sought either by politicians or doctors. A New York physician, at the request of the President, prepared and submitted a partial and provisional list for the consideration of an informal gathering of about thirty physicians, holding membership, probably, in every representative medical society in the city, but present simply as individual citizens, assembled on short notice over the telephone. With the aid of a medical directory the list was completed, with an alternate name for each division wherever there was a second man in the area who was favorably known to anyone present. We were informed that one serious objection would suffice to cross a name off the list. Nothing was said about compensation. From *Regulations Governing Disbursements Incident to the Registration and Selective Draft*, we since learned that no member of a local board can claim compensation in excess of four dollars per day; and that only for each day upon which a meeting is actually held. There is no allowance for personal expenses or meals, except for necessary travel outside of the local division on special business of the board.

If required, an additional physician may be appointed by the board. This is practically essential as the Regulations require examination by another doctor where the first examiner finds the men physically disqualified. One other additional physician may be appointed by the board if the number of persons to be examined in any one day shall exceed eighty; two other additional physicians if the number shall exceed 120; three more for upwards of 160; and "other additional physicians may be appointed by the local board in like ratio under similar conditions." If the local board is working harmoniously, the additional physicians are apt to be friends or acquaintances of the medical member or other members of the board, vouched for by the proposer and unanimously chosen by the board. They are thus qualified for service until more definitely appointed by the Government. They need not reside in the area under the jurisdiction of the board. Those physicians and such others as may be called upon in an advisory capacity seem to have acquired the reputation of constituting a medical board in any division which has been so organized. The regulations recognize nothing beyond the medical member of the local board, and each additional physician individually.

Compensation.—The compensation of examiners is limited to a charge of not more than one dollar for ten, or less than ten, examinations; not more than two dollars for twenty, or between ten and twenty, etc.; and not more than four dollars for the maximum number examined by one physician on any one day. The national Government bears the expense and hopes, we are told, that board members and examining physicians will work gratuitously unless they actually need the money. "The State of New York will particularly take pride in keeping down the Government cost of securing the State quota for the draft." I have not heard that statesmen and legislators have set the example of declining to put in a claim for such munificent remuneration. A report on health and habits, mind and body, together with a record of physical examination, stripped, is not really dear at "ten for a dollar," so to speak, and there should be no imputation of poverty in accepting the fee. Probably very few New York physicians will bother about it.

Decisions and provision for appeal.—The physical examination and all work of the board are covered by a full set of regulations, and these are supplemented and modified by instructions and suggestions from the provost marshal general's office at Washington, representing the President and the War Department, and the adjutant general's office for the governor and the State of New York; the latter has designated a very capable representative to facilitate the work in New York City. The local board passes upon the reports of the physical examination and all claims of exemption. A small number of district boards will sit as a court of ap-

peals. Provision is made for an appeal from a decision of the local board, either on behalf of the Government or of the man. Blanks covering practically every ground for a claim of exemption or appeal are furnished on application. They are in the hands of the local board. With few, if any, exceptions the decision of a district board is final. There seems to be no provision for an appeal to the courts.

Physical examination of recruits under the draft.—The most striking thing about this examination is that the official form for the record omits any specific reference to the lungs and calls for uranalysis only in suspicious cases. I am aware that this matter is fully covered in the instructions elsewhere. The evident purpose of the Government in this preliminary physical test is to weed out the obviously unfit; but that is not all. It is still more important to retain under the draft those young men who possess the requisite physical and mental qualifications for military service. When the examining physician is in doubt, the benefit of the doubt is to be given tentatively in every case to the Government; the candidate is held for further examination. Even when the examining doctor of the local board considers the man physically defective, the regulations definitely provide for a second and independent examination by another physician, and the board must pass upon the reports of the two doctors in determining its recommendation for exemption. And, again, that is not all. The Government may require the district board to pass upon such cases where the disqualification is not sufficiently obvious.

It is in this respect that the preliminary examination under the draft differs from the strict military examination under the volunteer system, especially in times of peace. Then we were trying to exclude all but the finest young men of the country. Now we are at war! Let no one forget that fact! The nation is employing a system of selection which is the fairest that could be devised. It is the obvious intention of the Government to exempt every man who is unfit, or whose services are more important in civil life than in the military establishment. On this first enrollment of nearly ten million men, there will be plenty to supply over and over the required quota for the first National Army. But no man may be permitted to shirk his duty under fictitious or exaggerated claims of disability now that it means that under such circumstances some other man must take his place. Hence, it is my interpretation that the first physical examination conducted by the local exemption board is obviously for the purpose of excluding those who are obviously unfit.

Thus far I have used the word "exemption" and omitted all reference to the term "discharge." There is a difference, but we need not go into that. I mention it simply for the sake of accuracy. It should be understood that exemption, as we are employing the word, is only temporary. If the local board exempts a man and issues a card of exemption, and the Government does not appeal from the local board to the district board, nevertheless, under certain circumstances the man may be summoned to appear again later. This is true whether the exemption is for physical, financial, or other reasons. Of course, where the disability is absolute, there is little likelihood of a second call. Complete records are to be kept on file. The recruits not exempted by the local board become provisional members of the new army. They now in their turn have the right to appeal from the decision of the local board and all records of such cases will be forwarded to the district board, which will pass upon the evidence and may order further physical examination if in its judgment such further examination is necessary. If the candidate is held by the district board, he may still be rejected later.

This leads to an understanding of the comparatively inadequate physical examination by the doctor of the local board. As I have said, the purpose of the first examination seems to be to weed out the obviously unfit. Before acceptance in the military service of the United States, each drafted man who has not been exempted by the local or by the district board will be subjected to "physical examination at the place of mobilization" by a surgeon of the army or navy, or such other qualified medical officer as the Government may appoint. In the first quota of the draft the standard requirement will probably be high. Considerable numbers who have passed the exemption boards will probably be rejected.

The method of selection as outlined above is probably as good as could be devised. The medical examiners taken from civil practice and placed upon the local boards may be comparatively inexperienced and, one may say, to that degree incompetent. After a thorough perusal of the regulations and requirements of the first examination, however, it seems to me the average doctor may be looked upon as well qualified for his task. He has the privilege of summoning to his aid in an advisory capacity, among the additional examiners granted under the law, men of greater experience, or even experts if he knows such men who are willing to serve.

Some one asked Mr. Conkling, at a recent meeting of exemption boards, "What would you do if you found they were not willing to serve?" "Well," he replied, "I think I would tell 'em what I thought of 'em and try for someone else!"

The writer has been fortunate in associating with himself for the local board examinations Dr. Alfred C. Prentice, formerly surgeon and major of the Seventy-first Regiment. As about six hundred young men were notified to appear for examination within three successive days, we arranged to devote practically our whole time to this work on the days appointed. As it seems to be assumed in the regulations that one doctor cannot examine more than about forty men a day, our Local Board for Division No. 154 unanimously recommended Dr. Albert E. Sellinings, Dr. Colin L. Begg, Dr. Charles E. Nammack, Dr. Attilio M. Caccini, and Dr. Frederick Van Vliet as additional examiners, and we believe we have organized a unit which will handle the work with ability and despatch.

The question was very properly raised, "Why should we doctors be obliged to examine all the men summoned to appear before the local boards al-

though a large percentage of these will be granted exemption by reason of claims based upon industrial positions and support of relatives and on proof that they are aliens not subject to the draft?" Mr. Conkling's answer was, "Well, first of all, because it's orders from the War Department." And certainly that settles it. But, naturally, there is a reason behind the order. Doctors understand as well as any class of men the importance of a complete history of everything bearing upon a case. In the case, for instance, of a man to whom an exemption card was issued on the ground of being the sole support of an aged and infirm parent and who is released from the obligation of support by the death of the parent, his exemption automatically expires and he is again subject to military duty. Suppose the man has lost an eye, he would still be exempted on that account. There can be no better time than the present to record all the conditions on which he is entitled to exemption.

The investigation of an alleged defect upon which a man bases a claim must be more rigid than the rest of the examination. At first glance, one would have assumed, perhaps, that this alone would have comprised this phase of the work of an exemption board. Such a plan would be very shortsighted. The order of procedure has been well thought out in a spirit of fairness, let us assume, to everybody, including the doctor. I can speak for every examining physician when I say that the doctors are doing their duty.

19 Fifth Avenue.

MEDICAL NEWS FROM THE FRONT.

Treatment of Penetrating Wounds of the Chest (Continued).—Insects and Disease in the War.

Geneva, *July 16, 1917.*

To continue a topic of my last letter, another series of cases which is of particular interest is one reported by Sencert, of Nancy, amounting to 130, 106 of which were due to rifle bullets, and twenty-four to either shrapnel or bursting shell. Thirty men died. Rifle bullets perforating the thorax gave a mortality of five per cent., while wounds from artillery projectiles gave forty per cent. mortality. Death is usually the result of severe pleuropulmonary complications which are not influenced by late operation. It is proper to classify penetrating wounds of the thorax as slight, medium, and serious cases, and in a general way it can be said that in the present war the mortality is 3.33 per cent. for the first, twenty-four per cent. for the second, and forty per cent. for the third. Schmid, of Nice, who gives the same percentages, says that although thoracic wounds from rifle bullets usually present mild symptoms, there is no hard and fast rule as to this, because some end fatally. Hartmann's total has been thirty cases, one of which resulted from a bayonet thrust. In his experience rifle bullets generally pass through the chest on account of the penetrating force of the projectile, while shrapnel and bursting shell, having a lesser force, are rather more prone to remain in the cavity. He shows that shrapnel shot may remain in the thorax without causing any untoward effects, but he lays stress on a case in which a projectile lodged behind the heart resulted in serious symptoms.

Resection of the ribs, followed by removal of the projectile, is indicated in cases of thoracic wounds from bursting shell, and Hartmann had five recoveries in five cases. It is evident that statistics of penetrating chest wounds are not always correct, because the serious cases causing rapid death are not included, as they are overlooked by surgeons in the large base hospitals for the reason that they never reach them. It is likewise true that some wounds are recovered from with extraordinary rapidity and without complications, but this is rather the exception.

Briefly, penetrating wounds of the thorax are more or less serious, according to the nature of the projectile; those produced by shrapnel and bursting shell usually result in death. Pulmonary complications in bullet wounds of the chest are either serious or limited in extent and are then recovered from in most cases. As soon as pleural complications assume a certain gravity they almost invariably end in the formation of a pyothorax and should be dealt with surgically without delay by thoracotomy with resection of the ribs and free drainage.

* * * * *

The present war has given rise to much research work on insects, particularly lice, bedbugs, etc., and their relation to disease and its spread. The results so far obtained may be summed up as follows: The intestine of the bedbug, Cimex lectularius, is in the normal state free from bacteria. The insect is endowed with manifest bactericidal and parasiticidal properties, but all the parasites which this insect may derive from the blood or integuments of man or animals are not destroyed with equal rapidity. Some of them, such as the Trypanosoma cruzi, resist the parasiticidal action, multiply, and are found alive in the dejecta. If a bedbug bites a healthy subject a few days after having become infected from a diseased subject, the insect is quite capable of inoculating microbic diseases, such as the plague and leprosy, perhaps tuberculosis as well. As far as the plague and tuberculosis are concerned, the part played by the cimex is a secondary one when the common factors of these diseases are considered, but in the case of leprosy, a disease inoculated by a domestic insect of nocturnal instincts, the cimex must be looked upon as the principal, if not the sole, cause of infection.

The bedbug also transmits recurrent fever, thus acting as a substitute for lice, Pediculus capitis and vestimenti, but the part played by it is evidently secondary. It is an important etiological factor in the transmission of Trypanosoma cruzi, but it is not probable that it intervenes in the transmission of other trypanosomoses. It does not transmit either typhus or leishmanioses. Cimex hemipteros and Leptocimex boueti act in the same way as the Cimex lectularius, the former in the case of spirochetosis and leishmaniosis, the latter in respect to oppilation. Cimex pipistrelli transmits the trypanasomosis of the bat. The hemipterous insects of the family of Cimicidæ are, therefore, pathogenic, or at all events are to be looked upon with suspicion. Their destruction is a question of utmost importance to the health of armies.

MEDICAL NEWS FROM WASHINGTON.

Training of Ambulance Companies at Allentown, Pa.—Status of Medical Officers' Reserve Corps Enrolment—Special Courses in Military Laboratory Work and Military Röntgenology for Medical Officers—Surgeon General Asks for Automobiles for Field Work.

Washington, *August 13, 1917.*

The ambulance companies organized at Allentown, Pa., under command of Major Elbert E. Persons, of the army Medical Corps, have about completed their training and are nearly ready to be sent abroad. Before being ordered to field service, as in the case of other army organizations, a most careful physical reexamination of the personnel is being made, particular attention being given to the identification of cases of tuberculosis, for which purpose Contract Surgeon William S. Wray, U. S. Army, has been ordered to proceed to Allentown and examine the command.

The ambulance companies will supplement and assist the organizations of the army engaged in the transportation of the sick and wounded from the zone of the advance to the base hospitals and from the base hospital to the general hospitals. The personnel may be used to man ambulance trains, hospital trains, hospital ships, and other agencies for sick transport by land and water, or for the establishment of emergency hospitals. Every ambulance company includes one captain; four first lieutenants; one sergeant first class; eleven sergeants; five mechanics; two cooks; two assistant cooks; twenty chauffeurs; two musicians; forty-three privates, and such other personnel as may be approved by the Secretary of War. The training of the companies has included instruction in first aid, elementary hygiene, and the drill of sanitary troops. The men have been made familiar with the use of the various appliances, including improvisations, for transporting sick and wounded, such as litters, ambulances, and other vehicles, with the fitting up of trains and ships for patients, and with other similar duties. Instruction also has been given in the organization and conduct of rest stations, and some of the men of every company have been made proficient in methods of disinfection.

* * * * *

The first 12,000 trained medical officers of the 24,000 needed this year for the military establishment are already in sight. The Medical Officers' Reserve Corps now numbers 350 majors, 1,367 captains, and 7,158 first lieutenants. These figures embrace only such men as have formally signified their acceptance of commissions. Several thousand others have qualified, but for some reason have failed to accept proffered commissions. In a majority of cases it is believed that this delay has been caused by a desire to settle private affairs and to secure substitutes to take care of civil practice. As rapidly as shelter is ready, the prospective medical officers will be sent to the training camps at Fort Oglethorpe, Ga., Fort Benjamin Harrison, Ind., and Fort Riley, Kans. Recently the average number receiving orders to the training camps has been about 200 a day. Moreover, for the training of medical officers and sanitary personnel generally on duty with troops, special courses have been instituted at posts, garrisons, and field encampments, the courses being so arranged that spare time may be devoted to them. A medical detachment has been organized for each national army cantonment, to which places the detachments will be sent in advance of the troops, in order that preparations may be complete to safeguard the health of the recruits. Only highly trained men will be assigned to troops sent abroad, selections being made from those most fitted for this duty as the contingents prepare to embark from time to time. In addition to the 24,000 medical officers, it is estimated that the medical and sanitary service of the military establishment will require some 120,000 enlisted men.

* * * * *

Selected members of the Medical Reserve Corps continue to be sent to pursue other courses in order better to fit them for special work at hospitals, camps, and in the field. Instruction in laboratory work is being given at Rockefeller Institute for Medical Research at New York under direction of Major Simon Flexner, Medical Reserve Corps, and Dr. Alexis Carrel. Courses in military röntgenology are being conducted under supervision of Major Leon T. LeWald, Medical Reserve Corps, at Cornell Medical College, and by Major Lewis G. Cole, Medical Reserve Corps, at New York; by Captain Edward S. Blaine, Medical Reserve Corps, at Chicago; Captain W. B. Bowman, Medical Reserve Corps, at Los Angeles; Major Frederick H. Baetjer, Medical Reserve Corps, at Baltimore; Major Willis F. Manges, Medical Reserve Corps, at Philadelphia; and Major Alfred L. Gray, Medical Reserve Corps, at Boston. Major Arial W. George, Medical Reserve Corps, also has been assigned to this instruction duty at Boston. Orders have been issued assigning Major George C. Johnston, Medical Reserve Corps, to active duty at Pittsburgh, to take effect about September 1st, for duty as instructor in military röntgenology.

* * * * *

The surgeon general of the Public Health Service has asked that Congress enact legislation that will give him authority to purchase motor vehicles for field work. He says that in much of the field work of the service in which it is necessary that workers travel daily through localities where there is no regular means of transportation, the use of motor vehicles is indispensable. In consequence of the statutory prohibition of the purchase of motor propelled, passenger carrying vehicles, such vehicles, when required, necessarily have to be hired by the day or the hour. The rental rates are such that the amount expended in many instances in a month would pay for an automobile and its entire operating expenses during that time. As a measure of economy, both in money and in the time of officers, it is advocated that the purchase of automobiles be authorized. In the work that the Public Health Service is now undertaking for the sanitation of the extra cantonment zones, work that is of the utmost importance to the health of the civil and military population, it has been found necessary to use automobiles in order that sanitary surveys may be made rapidly and that proper supervision may be exercised over work that is now under way.

Editorial Notes and Comments

NEW YORK MEDICAL JOURNAL
INCORPORATING THE
Philadelphia Medical Journal
and The Medical News
A Weekly Review of Medicine

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Address all communications to
A. R. ELLIOTT PUBLISHING COMPANY,
Publishers,
66 West Broadway, New York.

Subscription Price:
Under Domestic Postage, $5; Foreign Postage, $7; Single copies, fifteen cents.

Remittances should be made by New York Exchange, post office or express money order, payable to the A. R. Elliott Publishing Co., or by registered mail, as the publishers are not responsible for money sent by unregistered mail.

Entered at the Post Office at New York and admitted for transportation through the mail as second class matter.

Cable Address, Medjour, New York.

NEW YORK, SATURDAY, AUGUST 18, 1917.

SHALL THE NATION GO BONE DRY?

It has been felt by every one that the entrance of the United States into the world arena would mean sooner or later the serious consideration of prohibition, relative or absolute. Just how pressing such a consideration is and whether or not it should be allowed to have precedence in the legislative mind over such questions as food control, revenue measures, etc., are matters about which there is a wide difference of opinion. At the time of writing this, the matter of absolute prohibition has not been settled by any means. In this, as in other matters which we have been forced to deal with since the declaration of war, we turn to the experience of our allies for guidance. Lord d'Abernon, chairman of the Board of Liquor Control for England, summed up that nation's experiences admirably in a lecture before the Royal Institute of Public Health on May 16, 1917.

He alluded first of all to the surprising neglect of the significance of the liquor traffic in its effects on the health and wellbeing of the community before the war, in spite of the widespread knowledge of alcoholism in all of its phases. This he attributed, in part at least, to the tendency to regard the subject as a social question belonging to the moral sphere rather than to the domain of hygiene and public health. He lamented the fact that the question had not been approached as if it were one in preventive medicine, but had instead been the football of two opposing and extreme forces, liquor interests and prohibitionists. The result had been, to continue the figure of speech, to keep the subject up in the air; in other words, there had been no progress. Since the outbreak of war had rendered necessary some mitigation of the attendant evils of alcohol, the Board of Liquor Control had followed rather a middle course, which consisted of legislation regulating the strength of alcoholic beverages and the times during which their sale was permitted.

Lord d'Abernon quoted many figures tending to show the result which this regulation had had on public health. Thus in 1914, the figures showing the deaths due directly and indirectly to alcoholism showed an upward tendency, while in 1915, there was a distinct movement in the opposite direction. It must be remembered that the policy of restriction only came into force in the latter half of 1915. Then in 1916, the decrease was enormous, amounting to over forty per cent. in the case of men and to nearly fifty per cent. in the case of women. On examination of the statistics for drunkenness in England and Wales, the same sort of movement was found—an increase for 1914 over 1913, a moderate decrease in 1915, and a tremendous decrease in 1916. He concluded from these figures that much had already been done to limit alcoholic excess by a policy of moderate restrictions on drinking, in spite of many handicaps; also that the experience of the last two years had demonstrated that intemperance could be diminished to a considerable degree by legislative and administrative action.

These conclusions of Lord d'Abernon will be encouraging to those who believe that we must look to legislation to cure the alcoholic evil. Whether we go bone dry or not, there is no doubt that some regulation of the liquor traffic must be imposed during the course of the war. Perhaps this will be such a system as is in use in Sweden; perhaps something else. At any rate Doctor Mayo will find many in the profession to join him in his indictment of John Barleycorn in his presidential address before the American Medical Association in June of this year.

TESTS FOR ALLEGED DEAFNESS IN EXEMPTION CLAIMS.

In the examination of men claiming exemption from military service it becomes very important to know the exact degree of hearing in the individual case. Many will claim deafness when in fact the hearing is practically normal, and unless the examiner is very astute a candidate gifted with a fair degree of histrionic talent may be rejected although physically fit in every other respect. A recruit may be quite honest in his belief that his hearing is permanently impaired, when the removal of a mass of inspissated cerumen will fit him for service. There is often a history of otalgia since childhood without visible signs of old scars in the drums. Such cases must be studied with especial care, for a patient may be totally deaf with a drum that looks normal, or on the contrary may have a good degree of hearing when the drum is almost totally destroyed. In the former contingency, the causes commonly met with are degeneration of the cochlear nerve after the acute infectious diseases such as meningitis where the middle ear itself escaped infection or degeneration due to chronic constitutional disease such as syphilis. There are many cases of syphilis that have been treated with arsenical preparations which are complicated by a neurorecidive in the nerves of vision or hearing. Such deafness usually comes on suddenly, not uncommonly in the morning when the patient arises, no sign of its presence having been manifest on the previous day, or it may come on gradually over a period of one year or more. This type is absolutely incurable. Apoplectiform types are also to be noted such as those which follow embolism or fracture of the skull through the labyrinth. The falling tests which have been applied in work with the Exemption Board are not new, but are probably not widely known in America. Every specialist who has studied otology in Vienna has seen them demonstrated, or has applied them himself while working in the various clinics. In Austria there are, or rather were, a great many requests for exemption from military service because of partial or absolute deafness, and it therefore became necessary to weed out the malingerers from those actually unfortunate. The two most commonly applied were the Stenger test and the reading test.

The Stenger test depends upon the following principle: Two tuning forks of exactly the same size, pitch, and amplitude are set in vibration; one of the forks is held an inch away from the right ear. When the other fork is brought up to the left ear, the fork at the right ear is no longer heard by a person who has about the same degree of auditory acuity in both ears. To test a recruit who says he is deaf in his left ear, set the forks vibrating by striking one against the other. Hold one fork in front of the right ear. It is heard, of course. Then bring up the other fork toward the left ear and ask if the fork at the right ear is still heard. If it is not, then the left ear is functioning; if it is heard the left ear is not functioning. In a normal case the sound of the vibrating fork will not be heard by the right when the left fork is approximated or vice versa, as has just been explained. The contingency of two deaf ears does not often present itself with malingerers; for there is always plenty of evidence from friends or acquaintance that the examined man heard before coming up for examination. A satisfactory test in such case is to line up the malingerer with a number of other recruits known to possess good hearing, and when their undivided attention is obtained, say in an ordinary voice, "All those who are deaf will now be excused from service." Taken off his guard the malingerer will inadvertently drop out of line. Or one may say, "Do you expect that your brother will be exempted too?" In his anxiety the candidate is quite sure to make some answer.

Another exceedingly valuable test is the so called "reading test." If a normal person is asked to read aloud continuously and suddenly has the sound of his own voice excluded by two noise apparatuses, he will unknowingly raise his voice almost to a shriek. Suppose he claims a severe degree of deafness in his right ear. If he is asked to read aloud and the noise apparatus is set going in his left ear, the voice will be raised if the deafness is real; and, if not, there will be no change in loudness or pitch. This test requires the Bárány noise producer, *lärm apparat*, to be carried out effectively.

Malingering is simply a condition of mind, and it is quite easy to tell from nervous strain, the highly exalted mental state, the effort to exaggerate every little symptom and to know just what is going on within. Moreover, men who have always enjoyed a good measure of health get sadly mixed on symptoms, and any clinician with a grain of experience will recognize at once that the alleged symptoms are spurious. The hearing tests are especially important, for it might prove nothing short of a calamity to admit a man to service who misunderstood the commands. Government requirements of at least fifty per cent. hearing are very just to everyone concerned; no one who cannot hear a whisper in a quiet room at ten feet should be accepted. That is a minimum which protects the soldier against surprise attacks, and below this limit the battlefield becomes a much more dangerous place than it really is for the normal man.

SOME EXPERIMENTS UPON EPINEPHRIN.

The question of the indispensability of epinephrin to the welfare of the bodily organism is discussed and elaborated by the recent experiments of G. N. Stewart and J. M. Rogoff upon the liberation of epinephrin from the adrenals [*Journal of Pharmacology and Experimental Therapeutics,* July, 1917]. These experimenters had already determined that the section of the nerve supply of the adrenal prevented the liberation of epinephrin in any demonstrable quantity in cats as long as five weeks after the operation. The method of interrupting the nerve supply is to section the fibres to the semilunar ganglion, including the splanchnics, or the two sympathetic trunks, also including the splanchnics, in the thorax. The blood from the adrenal vein is collected in a cava pocket and then released to test the dilatation of the pupil and retraction of the nictating membrane of the eye. Though these tests proved negative, allowance must be made for a great dilution of the blood before it reaches the structures involved. Therefore more sensitive and more convincing tests were also made directly upon rabbit intestine and uterine segments.

Both acute and survival experiments were undertaken. The value of the first lay in the test of the effect of nerve section proceeding piecemeal, but could not be counted upon for thorough accuracy, since some epinephrin might continue to be washed out from the adrenal capillaries, and moreover some nervous action might still exist upon the adrenals of the sectioned nerves. In the survival experiments these difficulties were obviated. The result of the acute experiments was to prove undoubtedly the reduction of the liberation of epinephrin to a small fraction of the original normal output, but there remained still enough of the epinephrin to cause reaction in the rabbit tissue, although the eye tests proved negative. The survival experiments were more conclusive as to the dependence of the output of epinephrin upon this nerve supply, since in them the negative results appeared decisively in the rabbit tissue tests, where in a number of cases absolutely no epinephrin was detectable. Besides this, the normal healthy condition of the cats experimented upon as long as fifteen weeks after the nerve supply was severed, the other adrenal being excised, seemed to prove that life and health may be preserved without the liberation of epinephrin from the adrenals, unless, as the writers suggest, the quantity necessary is, even in the blood of the adrenal vein, below the limits of detection according to the methods employed.

That the liberation of epinephrin is entirely under the control of certain nerves they believe to be sufficiently indicated by the experiments. The detection in some cases of a small amount of epinephrin, even though an exceedingly small fraction of the normal output, they explain on the ground of some minute fibres of the innervation having been overlooked in section. Further corroboration of the ability of the organism to survive the withdrawal of the supply of epinephrin is demonstrated, they believe, by those lesions of the spinal cord survived by both men and animals, where the innervation path of the adrenal has been interrupted. The possibility of the discharge of a certain amount of epinephrin from the sporadic chromaffin tissue is suggested, though no weight is put upon the suggestion in the absence of any knowledge of such liberation from this substance. Whatever vitally indispensable quality may be possessed by the adrenals seems to be able to be carried on in an emergency through the blood or lymph when an interruption takes place in vegetative reflex arcs.

THE NEW FIELD AMBULANCE SERVICE.

The close affiliation between the American and the French troops is forecast by the order issued some days ago for the reorganization of the tactical units of the American army along the French lines. A division in the American army has heretofore comprised about 28,000 men. The French division has only about 19,000 men. Since the American troops are expected to cooperate closely with the French, General Pershing recommended and the War Department has adopted the suggestion that the French divisional unit be taken as a model so that a division of American troops can occupy a portion of the line when vacated by a French division without confusion and the need for readjustment.

Nor is this the only direction in which the French models have influenced the organization of our army. The field ambulance service carried on by the American volunteers for the French army has been taken over by the Medical Department of the United States Army and a corps has been organized and is being drilled along similar lines which will furnish the mobile ambulance for a great portion of the French army at the front. Under this plan one ambulance unit, consisting of a lieutenant, forty-five men, twenty ambulances, three motor trucks, and one staff car will be supplied to each division of the French army. At least 160 such units will be supplied, in addition to those provided from the volunteers already in France. Twenty such units have already sailed for France under the command of Lieutenant Colonel Percy W. Jones, Medical Corps, and are probably now on the French front.

One of the interesting features of the inaugura-

tion of this corps is that it has been so promptly provided to meet the emergency. It is hardly two months since the concentration camp for the organization and training of these units was established at Allentown, Pa., under the command of Major E. E. Persons, Medical Corps, who has since been promoted to the rank of colonel. Over 5,000 men have been enrolled at the camp, about a thousand have been sent abroad, and 4,100 are now under training. While the officers have so far been drawn from the Medical Corps or the Medical Officers' Reserve Corps, they will gradually be replaced in France by nonmedical officers promoted from its ranks, leaving the medical men at liberty to do purely medical work.

GIVE THE NONCOMMISSIONED VETERAN A CHANCE.

The motor ambulance convoy of the Royal Army Medical Corps comprises four officers and eighteen men of that corps and four officers and 157 men of the Army Service Corps. In the French service the ambulance unit is smaller, and has no medical officers attached to it, the function of the ambulance convoy being one purely of transportation. Both these armies have realized the necessity for conserving the time of the trained medical man by relieving him of nonmedical duties as far as possible. Our own service might well follow suit and give well earned promotion to the senior members of the noncommissioned staff on whom the medical officers taken in from the reserve corps must lean to a large extent for aid in their administrative details. The old and noncommissioned officers in the line have been given a chance to gain commissions. It certainly seems that the service would be the gainer if a similar opportunity were given to the older noncommissioned officers in the Medical Department.

THE NATIONAL SERVICE HANDBOOK.

"It is not an army we must shape and train for war; it is a nation." This statement by the President is the keynote of a document which represents the democratization of war, the National Service Handbook, issued by the Committee on Public Information. Nothing is to affect the outcome of the great struggle so directly as the unity of thought, purpose, and action of the whole people. The assumption by each individual of the nation of a definite responsibility in service for the whole is the goal and the means to this end is offered in the most widespread publicity which this organ gives to all forms of service. An encyclopedia of a fighting nation—information, facts, instruction on every phase of activity connected with the prosecution of the war are here gathered together for universal consumption and individual application. It is the duty of every citizen and patriot to acquaint himself with the whole. He may be familiar with much of it but it crystallizes, defines, and correlates the great purpose and brings home the reality of the struggle, still so far away. The section which is of especial interest to our readers, Medical and Nursing Service, gives general and specific information on the plan, organization, and operation of medical military service and of the Red Cross. Its definiteness and conciseness preclude the plea of misinformation and ignorance as to one's duty and responsibility and satisfy the doctor's desire for authoritative direction. This desire the JOURNAL is constantly endeavoring to meet and this channel of cooperation with the Government is of utmost importance to the public and the press which serves it.

TO EXEMPT MEDICAL STUDENTS.

As the result of an active agitation in the medical profession the Council of National Defense has asked that the medical students be exempted from the draft so that they may be able to continue their studies and enter the service as surgeons. Dr. Victor C. Vaughan, of the Medical Advisory Board of the Council, is carrying on an active agitation to this end and has obtained from the Secretary of War his approval of the movement. Only recently we pointed out editorially the necessity for the exemption of the medical students, and it is gratifying to note that this need has been recognized by the Government authorities.

News Items

Fort McHenry to Be Converted Into a Military Hospital.—Buildings costing $500,000 are being erected by the federal government at Fort McHenry, Baltimore, on ground which was loaned to the city for a park, but which has since been reclaimed. These buildings, though originally planned for the use of the Immigration Bureau, will be used as a base hospital by the army, and the old buildings at the fort will also be refitted for hospital uses.

A Social Centre for Ambulance Men in France.—Mrs. H. C. Coe, of New York, the wife of Major Coe, of the U. S. Army Ambulance Corps, has collected a considerable fund for the establishment and maintenance in Paris of a social centre where the men of the American Air and Ambulance Services will be afforded all the comforts of a home when on leave in Paris. When Mrs. Coe sails for France she will take with her an American cook so that her guests will have home cooking.

Medical Stenographers Wanted.—Attention is directed to the fact that medical stenographers are needed in the offices of the Surgeon General, Washington, D. C. The salary at the start will be $1,000 a year, and the hours those of other departments of the service. The necessary civil service examination has been so simplified that it will present no difficulties. For further particulars write to Major H. D. Corbusier, Surgeon General's Office, Washington, D. C.

National Surgical Dressings Committee an Auxiliary of the Red Cross Society.—Announcement is made that the National Surgical Dressings Committee, one of the most important of the war relief organizations in this country, has become an auxiliary of the American Red Cross Society. The arrangement with the Red Cross provides that the surgical dressings committee shall retain its name and organization and carry on its present work in the United States as a national auxiliary of the Red Cross. It may solicit funds in its own name, but no solicitation shall be made in the name of the Red Cross unless all the proceeds therefrom are turned over to the Red Cross organization. The French section of this committee will become the surgical dressings service department of the American National Red Cross. It will administer in France all the surgical dressings work of the Red Cross.

Physicians Who Are Drafted May Get Commissions.—According to a ruling of the War Department, physicians who have been drafted are not prohibited from applying for commissions in the Medical Officers' Reserve Corps.

Personal.—Major E. E. Persons, Medical Corps, U. S. Army, commanding the Ambulance Corps training camp at Allentown, Pa., has been promoted to the rank of colonel in the National Army, and several members of his staff have likewise received promotion.

The Manual of the Medical Department of the Navy.—A new edition of 4,000 copies of this volume is in the hands of the printer. The revision includes changes in the regulations since the last edition, standardization of surgical dressings and shell wound dressings for all ships, description of identification tags and method of preparation, a chapter on female nurses, and information in regard to the reserve personnel.

Promotion of Public Health Service Officers.—A board of commissioned medical officers has been convened to meet at the call of the chairman for the mental and physical examination of certain officers of the Public Health Service to determine their fitness for promotion to the grades of surgeon and passed assistant surgeon. Detail for the board: Assistant Surgeon General W. G. Stimpson, chairman; Surgeon M. W. Glover, member; Surgeon E. A. Sweet, recorder.

Intensive Training for Neurologists and Psychiatrists.—The Surgeon General of the Army has made arrangements for a course of intensive training for selected officers in neurology and psychiatry at the Boston Psychopathic Hospital. This course will cover a period of six weeks, and First Lieutenant Arthur P. Powelson, Medical Reserve Corps, is the first student to be ordered to pursue the course. This is in line of the special efforts being made to identify among the military personnel those in any way affected with brain and nervous disorders.

New Building for the Knickerbocker Hospital.—Plans have been filed for the new building of the Knickerbocker Hospital, which is to occupy the entire block front on Convent Avenue between 130th and 131st Streets. The estimated cost of the building is $350,000. It will be six stories high, with a large roof garden and a circular operating room on the top floor. Two floors will be devoted to private wards, containing about 200 rooms, and the general ward rooms will provide for over 200 additional patients. The present hospital occupies a plot at the northwest corner of Amsterdam Avenue and 131st Street. It was formerly known as the J. Hood Wright Hospital.

More Red Cross Base Hospital Units for Service in France.—The following Red Cross base hospital units are being organized and will soon be ready for service abroad: No. 19, Rochester, N. Y., General Hospital, Dr. John M. Swan, director; No. 20, University of Pennsylvania Hospital, Philadelphia, Dr. John B. Carnett, director; No. 26, State University of Minnesota, Minneapolis, Dr. Arthur A. Law, director; No. 27, University of Pittsburgh Medical School, Dr. R. T. Miller, director; No. 31, Youngstown, Ohio, Hospital, Dr. Colin R. Clark, director; No. 32, City Hospital, Indianapolis, Dr. Edmund D. Clark, director; No. 34, Episcopal Hospital, Philadelphia, Dr. A. P. C. Ashhurst, director; No. 37, Kings County Hospital, Brooklyn, Dr. Edwin H. Fiske, director, and No. 38, Jefferson Medical College, Philadelphia, Dr. W. M. L. Coplin, director.

A Pharmaceutical Corps for the Army.—At a conference held at the office of the Surgeon General on July 24th, between a board of army medical officers and a committee of pharmacists, the pharmacists were requested to submit a formal argument setting forth their views as to the need for and the benefit which might be obtained by the establishment of a pharmaceutical corps. This brief has been submitted to the Surgeon General for consideration and is signed by George M. Beringer, president of the National Pharmaceutical Service Association, and Joseph W. England, of the Committee on National Defense of the American Pharmaceutical Association. The brief cites the method of organization followed in the German, the French, and the Spanish armies as a precedent which could with advantage be followed by the army of the United States. A bill providing for such a corps has been introduced into congress by Congressman George W. Edmonds, of Philadelphia.

Medical Society of the Missouri Valley.—The thirtieth annual meeting of this society will be held in Lincoln, Neb., Thursday and Friday, September 20th and 21st, under the presidency of Dr. C. R. Woodson, of St. Joseph, Mo. The meeting place and headquarters will be at the Hotel Lincoln. The arrangements for the meeting have been placed in the hands of a committee appointed by the Lancaster County Medical Society, under whose auspices the meeting will be held. Dr. K. S. H. Hohlen is chairman of this committee. The scientific program has been limited to twenty papers, including one or two patriotic addresses. Dr. Charles Wood Fawcett, of Kansas City, is secretary of the society and will be glad to furnish more detailed information regarding the meeting.

Venereal Clinics in Queens.—The Department of Health of the City of New York has established venereal advisory clinics in each of the four health centres in the Borough of Queens, with two consultation days a week for each clinic. The medical advisor will consult only with those applicants who are not under the care of a physician, and who come to the Health Department for advice regarding venereal diseases and sex matters. Under no circumstances will he interview patients sent by physicians or private institutions for the Wassermann and complement fixation tests, unless requests for advice are made by those physicians or institutions sending the patients. Such patients as require treatment are referred either to their family physicians or to approved clinics. All applicants are given a circular of information regarding venereal diseases, and a card of instruction regarding syphilis and gonorrhea. The histories that are taken are kept under lock and key and are regarded as absolutely confidential.

A Base Hospital Organized by the University of Virginia.—A base hospital has been organized by the University of Virginia, to be known as Base Hospital No. 41, with Dr. William H. Goodwin, associate professor of surgery, as director. The medical staff includes the following physicians: Dr. Lomas Gwathmey, Norfolk; Dr. Minor Carson Lile, New York; Dr. Kyle B. Steele, Richfield Springs, N. Y.; Dr. Leroy W. Hyde, University; Dr. Joseph S. Hume, Norfolk; Dr. John W. Burke, Washington, D. C.; Dr. Robert E. Pound, New York city; Dr. Gordon L. Todd, Princeton, W. Va.; Dr. Herbert F. Jackson, New York city; Dr. Hugh P. Nelson, Charlottesville; Dr. Dan H. Witt, New York city; Dr. Edward C. Ashby, Greensboro, N. C.; Dr. John D. Barnwell, New York city; Dr. Claude C. Caylor, Washington, D. C.; Dr. Lucius G. Gage, University; Dr. George C. Parry (dentist), Philadelphia; Dr. Edward B. Broocks, Charlottesville; Dr. Walter E. Miller, Norfolk, and Dr. George Y. Gillespie, Bryn Mawr, Pa.

Base Hospitals at Camps and Cantonments.—Arrangements are being completed for the establishment of a base hospital at each of the military camps and cantonments, and members of the Medical Corps of the regular army have been assigned to command them, as follows: Captain Jay D. Whitman, Camp Upton, Yaphank, Long Island; Captain William L. Sheep, Camp Travis, Fort Sam Houston, Tex.; Captain Omar H. Quade, Camp Meade, Annapolis Junction, Md.; Major Ferdinand Schmitter, Camp Lee, Petersburg, Va.; Captain Joseph A. Worthington, Camp Taylor, Louisville, Ky.; Captain Shelley U. Marietta, Camp Gordon, Atlanta, Ga.; Captain William H. Smith, Camp Green, Charlotte, N. C.; Captain William H. Allen, Camp Wadsworth, Spartanburg, S. C.; Captain Roy C. Heflebower, Camp Hancock, Augusta, Ga.; Captain James S. Fox, Camp McClellan, Anniston, Ala.; Captain Arthur O. Davis, Camp Cody, Deming, N. Mex.; Captain Charles C. Demmer, Camp Wheeler, Macon, Ga.; Captain Sanford W. French, Camp McArthur, Waco, Tex.; Captain John M. Willis, Camp Logan, Houston, Tex.; Captain Thomas F. Scott, Camp Sevier, Greenville, S. C.; Captain Philip B. Connolly, Camp Doniphan, Fort Sill, Okla.; Captain George E. Pariseau, Camp Bowie, Fort Worth, Tex.; Captain Chester R. Haig, Camp Sheridan, Montgomery, Ala.; Captain James E. Baylis, Camp Shelby, Hattiesburg, Miss.; Captain George F. Lull, Camp Beauregard, Alexandria, La.; Captain Robert W. Kerr, Camp Kearny, Linda Vista, Cal.; Captain Addison B. Davis, Camp Freemont, Palo Alto, Cal., and Major Ernest G. Bingham, Fort Des Moines, Iowa.

THE USE OF INEXPENSIVE DRUGS IN PRACTICE.

By Louis T. de M. Sajous, B. S., M. D.,
Philadelphia.

(*Continued from page 281.*)

A comparison of nitroglycerin with sodium nitrite as regards relative advantages and disadvantages in the treatment of conditions associated with high blood pressure led in the preceding issue to a general conclusion in favor of the latter drug, partly owing to its more prolonged action. That sodium nitrite is at present about twenty per cent. less expensive than nitroglycerin, dose for dose, was also noted.

In connection with this an unofficial drug, erythrol tetranitrate seems likewise deserving of consideration. Injected intravenously in animals in doses molecularly equivalent to doses of nitroglycerin, this substance has been found to exert quantitatively the same action as nitroglycerin when taken by mouth, however, its action is greatly reduced as compared to nitroglycerin, owing to the fact that it is insoluble in water. The dose has therefore to be much larger—0.5 grain instead of 0.01 grain—and the effects arise more gradually and are more prolonged. Thus, in the clinical investigations of Wallace and Ringer, 1909, the action of erythrol tetranitrate on the blood pressure was observed to begin only after fifteen to thirty minutes, as against ten to fifteen minutes in the case of sodium nitrite. The time of maximum effect, moreover, was noted as thirty-two to sixty minutes after the ingestion of the drug, as against twenty-five to forty-five minutes in the case of sodium nitrite and eight minutes in that of nitroglycerin, and the total duration of the effect was two to four hours, as against one to two hours in the case of sodium nitrite and thirty to thirty-five minutes with nitroglycerin. The maximum extent of blood pressure reduction from two grains of erythrol tetranitrate in patients with arteriosclerosis was sixty millimetres Hg, as against fifty-three millimetres Hg in the case of sodium nitrite and thirty-two millimetres with nitroglycerin.

While thus apparently advantageous as a substitute for the official drugs where a prolonged or continuous hypotensor action is desired, erythrol tetranitrate has at least one drawback. As noted by Wallace and Ringer, the nitrite headache is in normal subjects especially severe after the erythrol compound, and may even persist many hours after the return of the blood pressure to its original level. Erythrol tetranitrate is also known to be dangerously explosive, while sodium nitrite is nonexplosive. In these respects sodium nitrite is thus distinctly preferable to the unofficial compound. Wallace and Ringer specify, however, that in cases of abnormally high blood pressure the nitrites rarely induce headache, which may, indeed, be relieved by them if previously present. Probably, therefore, headache after erythrol tetranitrate is not as troublesome in high pressure cases as elsewhere. According to Matthew, neither erythrol tetranitrate nor sodium nitrite, on continuous use, establishes a condition of tolerance such as follows nitroglycerin.

On the whole, while all points are not uniformly in favor of sodium nitrite, it presents advantages sufficient to deserve preference. To secure a continuous therapeutic action, therefore, the frequency of repetition of the dose of sodium nitrite need not be as great as the blood pressure might indicate. Even were it deemed desirable to administer sodium sodium nitrite at shorter intervals than erythrol tetranitrate, the fact that the latter is at present about seventy-five times more expensive, dose for dose, would doubtless in many instances be held to outweigh the greater inconvenience attending more frequent ingestion of the former. That sodium nitrite is, as has been asserted by some, a relatively feeble agent seems controverted, not only by the comparative blood pressure observations already referred to, but by the experience of Wallace and Ringer with a patient who was given six grains of this salt, a fall of pressure from 210 to 100 millimetres Hg resulting.

In some groups of cases the substitution of erythrol tetranitrate for sodium nitrite because of its prolonged action may seem particularly desirable. Thus, the late Professor Huchard, with Fiessinger, 1909, considered the erythrol compound especially indicated in patients with angina pectoris who are awakened at night by the pain. It should also be borne in mind that the different nitrites in some cases show unexpected variations in their relative efficiency, one member of the group for some obscure reason acting more satisfactorily than another already tried. In a general way, however, the evidence at hand seems to show that sodium nitrite, the least expensive of the nitrites, can as a rule be substituted without prejudice for the other members of the group in cases not of the emergency variety. Nitroglycerin has been recommended in aortic insufficiency with marked hypertrophy and severe frontal headache; in cardiac irritability and palpitation due to tobacco; in aortic stenosis, double aortic lesions, or anemia of the chlorotic type accompanied by thoracic pains; in cardiac asthma in general in doses as small as 0.001 grain (Parker); in Raynaud's disease, erythromelalgia, and incipient senile gangrene, and in the reflex vasomotor disturbances of the menopause and the menstrual periods. In many instances of these conditions sodium nitrite would doubtless act as well as nitroglycerin; but in any case, the difference in cost between these two agents is slight. Where the inorganic salt is used, the fact should be remembered that its activity is soon weakened upon exposure to the air, the salt becoming oxidized to sodium nitrate.

(*To be concluded.*)

Rapid Reduction of Intraocular Tension in Glaucoma.—W. D. Sansum (*Journal A. M. A.*, June 23, 1917) points out that any desired degree of dehydration of the body tissues can be secured rapidly by the timed intravenous injection of glucose solutions. Glaucoma, being ascribed to ocular edema, can be reduced by such dehydration as demonstrated in two cases which are reported in detail. In the first the ocular tension was reduced from sixty mm. Hg to twenty-six mm. Hg by the intravenous injection of 11.2 mils per kilogram per hour of a 41.2 per cent. glucose solution, continued for sixty-nine minutes. The tension subsequently returned to a high level and the dehydration was twice repeated, using somewhat more dilute solutions of glucose over longer periods of time. After the third dehydration iridectomy was performed. In the second case the tension was too high to permit iridectomy with safety, and was therefore reduced from sixty to twenty mm. Hg by dehydration and the operation done at once with ease and success.

Development of the Paraffin Treatment of Burns and Open Wounds.—Torald Sollmann (*Journal A. M. A.*, June 16, 1917) expresses the belief that simple paraffin will accomplish all that the various paraffin mixtures will and that the most promising field for further improvement lies in the direction of the selection of the paraffin itself. The most suitable form for use should be more ductile and pliable than the official preparation, and there are on the market several commercial paraffins which are superior to the official substance in these respects. The paraffin should be liquid at a temperature of 50° C. or below and a thin film should be pliable at 28° C. and ductile at 31° C. Antiseptics and epithelial stimulants such as resorcin, betanaphthol, volatile oils, and sudan red, are of no value as additions to the paraffin since they are so firmly bound up in it when it cools as not to dissolve out and come into contact with the denuded surface. The application of the molten solid paraffin to raw surfaces is often somewhat painful, but this can be entirely overcome and equally good results secured by applying liquid paraffin as the first coat, over which cotton is spread and the solid paraffin painted on in the usual manner. This use of liquid petrolatum for the layer in immediate contact with the raw surface also opens up the possibility of applying local anesthetics, antiseptics, or epithelial stimulants. Where these are not soluble in the petrolatum, they may be dissolved in some olive oil. For this purpose such substances should be tested as the following: chloretone, 1:200 to 1:1,000; orthoform-new, one per cent.; camphor, from one to five per cent.; menthol, ten per cent.; oil of eucalyptus, resorcin, betanaphthol, gentian violet, and scarlet red. It may be advantageous in some cases to color the paraffin a flesh tint for cosmetic reasons. This can be readily accomplished by the addition of a trace of either scarlet red or sudan. J. R. Beiter in the same issue reports his extensive experience with the paraffin treatment, according to the usual method as well as with Sollmann's liquid petrolatum paraffin sequence. He finds that the latter method is far preferable to the direct application to the wound surface of molten paraffin, and that both paraffin methods are far superior to any other method of treatment. It is inexpensive, comfortable, and clean; it splints the wound and is easily changed and the dressing does not adhere to the granulations so that its removal does not interfere with healing and epithelization. The paraffin treatment does not, however, yield softer scars than other methods where there has been exensive destruction of the deeper skin layers. The technic for the application of the paraffin dressing is to clean carefully the burned area, open all blebs, cut away loose skin, thoroughly dry the burned surface with ether or by exposure to the air, and then to apply a thin film of the melted paraffin or of the liquid petrolatum. Over this a thin sheet of cotton is laid and painted with petrolatum, the edges being sealed to the skin.

Amputations Considered from the Artificial Limb Point of View.—Thomas Openshaw (*Lancet*, June 16, 1917) says that an artificial member can be fitted to any portion of the upper extremity, but that if even a single finger or the thumb can be preserved on the hand this is vastly preferable to its loss. No amputation through the wrist joint should be done if it is possible to leave any portion of the hand. The most satisfactory site for amputation through the forearm is at the junction of the lower and middle thirds. At least two inches of the ulna, below the tip of the olecranon, must be left or the amputation should be done above the humeral condyles. Amputation through the elbow joint is never one of election, but if it must be done the condyles should be removed from the humerus to permit the fitting of a proper socket. The site of choice for amputation through the arm lies in the zone between one and one half inches above the elbow and three below the fold of the axilla. In the shoulder it is better to remove the head of the humerus than to leave it, but an artificial limb can be fitted to the shoulder under any circumstances by means of a moulded leather cap. Such a member can be moved fairly freely by means of attachments which are pulled upon by movements of the opposite arm. In amputations of the toes specially made boots give good function. The most satisfactory amputation about the ankle joint is the Syme and it is ultimately required in almost every case where other forms of amputation have been done previously. The best amputation through the leg is one four or five inches below the upper border of the tibia, the fibula being cut about half an inch shorter. In such amputations it is absolutely necessary to keep the knee joint straight or a further amputation may be required. If as little as one inch of the tibia can be saved it gives a better result than amputations through or above the knee joint. Transcondylar amputation gives a good result if the bone is well covered and its edges rounded off. At least two inches of the femur should be left below the small trochanter or it is almost impossible to fit any form of artificial extremity. If as much as this cannot be left the amputation should be made through one or the other trochanter, or the bone should be exarticulated, the latter being the preferable procedure.

Treatment of Trench Foot.—B. Sherwood-Dunn (*Medical Record,* June 30, 1917) divides the treatment into five categories according to the stage of the disease. In the first, or simple edematous, form washing with warm water and a borated camphor soap is followed by the application of moist dressings of a solution of camphor 1.1, sodium borate 15, in boiled water 1,000. This is followed by the application of camphorated oil without rubbing. The vesicular form in which the vesicles are large is treated by denudation and removal of the gelatinous base with sterile gauze and the application of compresses of camphor, 30, in ether, 1,000, covered in turn by compresses of the borated camphor solution. The denuded surfaces may finally be dressed when improving by dusting with powdered camphor or boric acid. When crusts form they must be softened and gradually removed without causing bleeding, using camphorated ether, colloidal silver, or camphorated oil and borated vaseline. If a stage of extensive invasion arises then free incision should be made with a bistoury. The thermocautery which has given bad results should be avoided. Surgical operation proper should be avoided and bone left to be eliminated by the progress of the disease. In the stage of reparation the best dressing is a paraffin petrolatum combination applied hot and allowed to harden; this is changed daily and comes off readily without pain.

An Ideal Intracapsular Cataract Extraction.—Lloyd Mills (*Archives of Ophthalmology,* July, 1917) arrives at the following conclusions: Intracapsular extraction of cataract by any method yet devised should be performed only by men of large and constant surgical experience and possessed of keen surgical intuition. It is not reasonable to declare that intracapsular extraction is the only satisfactory method of removing cataract. While in selected cases the final visual results of the Smith intracapsular extraction are ideal, the cosmetic results are often less pleasing, and the routine application of any intracapsular method yet devised to unselected cases will bring sure disaster. In selected cases the extraction of the encapsulated lens through the intact pupil is a simple procedure in skilled hands, but the pupil is often drawn strongly upward as a final result, though this seldom interferes with the final vision. Prolapse of the iris, bulging of the wound, pupillary dislocation, and loss of vitreous are the direct results of dislocation of the vitreous, due partly to the pressure and more to a relative lateral flattening of the globe by the actions of the lateral recti. Vitreous dislocation can be prevented by enlarging the corneal incision so that the lateral recti are for the time as mechanically ineffective as the vertical recti, by a peripheral iridectomy, or by both procedures combined. In selected cases ideal cosmetic and visual results follow the extraction of the encapsulated lens through an intact pupil when combined with a peripheral iridectomy; the eye is protected from excessive flood with light by a mobile iris with a small, central pupil, and often the eye operated upon cannot be told from the other save by a deliberate examination.

Deep Röntgen Ray Treatment of Malignant Tumors.—Arthur Fenwick Holding (*American Journal of the Medical Sciences,* July, 1917) has studied the action of Röntgen rays with and without other adjuvant methods in 658 cases of malignant tumors during the past four years. From these he selected 258 cases as a basis for his paper in which the microscopical and clinical data were established beyond question. The cases eliminated were all those in which the diagnosis was not verified by competent microscopical examination, all in which the clinical data and subsequent histories were incomplete, cases in which treatment was discontinued, and cases of uterine carcinoma. Except in old advanced cases the results in cases of basal cell epithelioma were uniformly good, and with proper microscopical diagnosis, other more painful methods of treatment are unnecessary. The bad results in cases of squamous cell epithelioma are in marked contrast to the good ones obtained in the basal cell variety. A majority of the cases of carcinoma of the breast show a primary improvement by diminution in the size of the tumors, both primary and metastatic, with frequent disappearance of the latter. Metastases are more amenable than primary growths, and the earlier they are treated the more is this evident. He believes that the greatest emphasis should be laid on the value of the preoperative and postoperative raying in all cases in which surgical removal is contemplated, because the surgeon can never feel assured that he has not left behind isolated cells. These cells are best attacked when they are not connected organically with the circulation of the host. Cases of lymphosarcoma give the most brilliant primary results, but they relapse and the process proceeds despite all treatment. In pseudoleucemia, chronic lymphatic leucemia, and splenomyelogenous leucemia the lymphoma disappear as a rule, but relapse occurs and the patients die. All cases of carcinoma of the viscera failed to show noteworthy improvement except carcinoma of the thyroid and adenocarcinoma of the ovary. Only two cases of embryonal carcinoma appeared in the series; both showed marked initial improvement, but one relapsed, and the other is still in the initial improvement stage. The conclusions drawn from the study of these cases are: Röntgen rays give excellent results in basal cell epithelioma. They ameliorate cases of carcinoma of the breast, ovary and testis, tumors of lymphatic structures especially when these tumors are made up of cells of an embryonal type. Until an effectual constitutional treatment is discovered, efforts should be made to increase the ameliorating effects of radioactive methods, and the benefits obtained, particularly in postoperative raying and treatment against metastases, should not be ignored. Most of the improved cases eventually relapsed, and while their lives were prolonged and made more comfortable by the Röntgen ray treatment, the patients eventually died of the disease. In some instances the ameliorating effects were very striking and deserve particular attention in the hope that we may discover means of making these ameliorations more lasting and even permanent.

Treatment of Vomiting of Pregnancy.—C. R. Hannah (*Texas Medical Journal,* June, 1917) insists upon the patient taking her breakfast in bed and remaining there for one or two hours. The patient is allowed to eat whatever she wants at any time of the day and immediately after vomiting. Nothing should be done if the vaginal examination proves to be normal. Sodium bicarbonate should be given in large doses, one dram to eight ounces of water six times daily. Horse serum has been injected into the lumbar region as follows: one c. c. of normal horse serum is injected and then the patient is watched for three or four hours for the development of an anaphylactic reaction. If this does not occur, the remaining nine c. c. are injected. If it does take place nothing further is done. In desperate cases the serum is given with a quart of five per cent. glucose solution intravenously.

Carrel Method of Wound Sterilization.—William O'Neill Sherman (*Pennsylvania Medical Journal,* June, 1917), after a study of this subject abroad, reaches the following conclusions: The solution should never be heated; it should never be applied to or used in the eye or intravenously because of its hemolytic action; it should be kept in a cool place away from exposure to light; it should never come in contact with alcohol. Infection can be aborted if the treatment is begun within the first twenty-four hours. If suppuration is established, it can be controlled if the focus is reached. The success of the treatment depends upon the perfection of the Carrel technic and the acceptance of all the details. The effect of Dakin's solution is entirely local. There is no danger of toxemia from absorption, no matter how large a quantity is used. Carrel's technic, using Dakin's solution, may be regarded as a specific against infection.

Action of Oxide of Tin and of Metallic Tin in Staphylococcic Infections.—R. Grégoire and A. Frouin (*Bulletin de l'Académie de médicine,* May 29, 1917) call attention to the observation that among French tin workers furuncular disorders are unknown. Powdered tin has even become a popular remedy for boils. The authors have shown experimentally that metallic tin and the oxide of tin are actually absorbed from the digestive tract, and are innocuous. In experimental staphylococcic septicemia, salts of tin proved therapeutically active, and *in vitro* tin compounds markedly reduced the virulence of staphylococci under certain cultural conditions. Clinically, tin treatment gave prompt and identical results in fifty cases of furunculosis. The boils disappear usually within five to eight days upon ingestion of a mixture of metallic tin and oxide of tin in 0.5 gram doses. An opportunity to test the treatment in acute staphylococcic osteomyelitis has not been obtained, but in two cases of long standing bone suppuration following wounds the administration of one gram of the mixture daily resulted in arrest of the suppuration on the twelfth and the sixteenth days, respectively, and recurrence did not follow. Recent tests of the direct introduction of tin in colloidal suspension or in the form of solutions of chloride of tin into wounds infected with staphylococci gave encouraging results.

Treatment of Fracture of the Femur.—H. Judet (*Presse médicale,* June 21, 1917) asserts that in most cases of infratrochanteric fracture of the upper third of the femur in soldiers he has had occasion to see bone union had occurred in a very faulty position, the two fragments sometimes forming an angle of ninety degrees, with marked shortening of the limb and great difficulty in locomotion. To avoid such unfortunate results, which necessitate a secondary osteotomy, it is absolutely essential that the limb be kept in abduction during repair. Abduction with an extension apparatus is unsatisfactory, as the patient is apt to move in bed and the redressings are painful. A large plaster spica should therefore be applied, the degree of abduction of the upper fragment being ascertained at the time of the initial operation on the wound and the lower fragment then immobilized in a corresponding direction. Aluminum or wooden splints should be incorporated in the cast in order to permit of making a large lateral opening in the plaster for dressing the wound. In fractures of the femur in general Judet has noted a tendency to relaxation of the knee, with subsequent difficulty in walking, requiring for proper correction a hinged knee apparatus. This difficulty is due to excessive traction on the leg by an extension apparatus, with too little traction on the lower portion of the thigh. Where extension is used, this must be carefully guarded against, even at the expense of diminishing traction, as a slightly shortened limb is preferable to a loose knee joint.

Surgical Pneumothorax.—René Le Fort (*Bulletin de l'Académie de médecine,* June 12, 1917) asserts that war surgery has conclusively shown the harmlessness of surgically produced pneumothorax, unless there is severe myocardial disease. If a large opening into the pleura is quickly made, the operation becomes as simple as laparotomy, while if only a small opening is made, difficulties are experienced. With a small opening during the vigorous inspirations, air enters freely into the pleural cavity; the expirations being, on the contrary, performed easily, they are only of short duration and do not give time for all the air to leave the pleura. Hence a relative excess of pressure on that side compresses the lung and impels the mediastinal partition to the sound side. During expiration, moreover, some air from the sound lung enters its fellow, and may force a lobe of the latter against the chest opening, occluding it and instituting a valvular pneumothorax. Conditions are very unfavorable to the early establishment of a respiratory equilibrium, and there is much dyspnea. Where, on the other hand, a large opening is made, the lung on the side opened at once develops free movements during respiration. Such movements may even be so marked as to project the lung out of the chest. This lung therefore takes in air, and the greater the dyspnea the more air taken in, with a resulting favorable effect on oxygenation. Even at the worst, one lung is amply sufficient for this process in subjects with an empty stomach and with muscles relaxed. In none of forty operations thus conducted were there unfavorable effects on the heart or lungs during the operation.

Exophthalmic Goitre.—J. H. Means and J. C. Aub (*Journal A. M. A.*, July 7, 1917) made studies of the basal metabolism of a large number of cases of exophthalmic goitre in various stages of intoxication. They found that the basal metabolism provided a very accurate measure of the degree of toxicity in these cases, being on the average within the normal limits of variation in the nontoxic cases, forty-three per cent. above normal in the mildly, fifty-three per cent. above in the moderately, and seventy-six per cent. above in the severely toxic cases. It also gave a close measure of the response to therapeutic measures and it was found that rest in bed produced a marked fall in the metabolism and an improvement in the other signs of toxicity, and that the addition of sedatives or of quinine hydrobromide to the rest treatment did not hasten or increase the fall in metabolism. Intensive x ray treatment produced a similar marked fall in metabolism in a number of cases, while in others it was without effect. Surgical measures usually produced an immediate marked decrease in toxicity, but there was a definite tendency toward recurrence. The authors believe that the treatment of these cases should be by complete rest and intensive irradiation until the metabolism has reached a level; that if they fail to reduce the metabolism to within twenty per cent. of the normal resort should be had to surgery; and that further active treatment should be undertaken if there is a rise in metabolism after surgical treatment. The presence of a rising metabolism in spite of rest and irradiation seems to contraindicate surgical intervention.

Administration of Anesthetics at the Front.—Geoffrey Marshall (*British Medical Journal*, June 2, 1917) says that with lightly wounded men the chief considerations are safety, speed, and convenience, and that these are all best met by gas and oxygen anesthesia. When not available it may be substituted by warm ether given with a Shipway apparatus. In the seriously wounded cases stovaine spinal anesthesia was tried but found to be far too dangerous from fall in blood pressure and cerebral anemia, which resulted fatally in some cases. These symptoms did not respond to either pituitrin or strychnine, and lowering of the head was found to be the best restorative measure. In wounds of the extremities requiring amputation the operation should be postponed if possible until the shock has been somewhat relieved by putting the patient to bed and applying heat. Morphine should not be given before the operation and gas oxygen should be the anesthetic of choice. In the treatment of shock, in addition to bed and external heat, fluids should be given by mouth or rectum, as they are not absorbed from the subcutaneous tissues in such cases. Intravenous injections raise the blood pressure only temporarily and, if used, should be given at the end of the operation rather than before it, and then in the form of a hypertonic saline solution. Chloroform, ether, and large doses of morphine increase the dangers of shock and should be withheld from cases in which it is threatening. Most wounds of the head may be operated upon under local anesthesia, though in some cases light general anesthesia will be needed to allay the physical suffering. For this purpose warm ether and oxygen are best given through a catheter passed down one nostril. Ether should not be used in wounds of the chest, which should be treated under local anesthesia by nerve blocking, or under warm chloroform vapor plus oxygen, given after a preliminary administration of morphine, hyoscine, and atropine. Warmed ether and oxygen is by far the best in cases with abdominal wounds. Exposure of the intestines outside of the abdomen, even if minimized by wrapping in hot, moist cloths, is the greatest cause of rapid fall of blood pressure. The next most potent cause is the turning of the patient on to one side after the anesthesia has been maintained for over half an hour.

Carcinoma of the Uterus Treated by Radium and Röntgen Rays.—Russell H. Boggs (*American Journal of Röntgenology*, May, 1917) states that radium does not affect the tissues at a greater distance than two to three centimetres from the tube. Preceding and following operation, it is of unquestionable value. Cases without recurrence for a period of eight years have been recorded. In advanced cases the relief of the symptoms is so marked that every practising physician should be familiar with this fact. Discharge and hemorrhage usually disappear under its use sometimes within two or three weeks.

Treatment of Asthma.—Albert C. Geyser (*American Medicine, April*, 1917) examines the spine with a faradic current. Certain areas will be found to be hypersensitive to the current. A red spot usually appears in these areas. One pole of the faradic current is applied over this area and the other, a larger pad electrode, over the entire lung area anteriorly. The interruptions of the vibrator point must be at least 5,000 or more per second. After applying this current for from fifteen to twenty minutes the spasm will be relieved and remain so for several days. If this treatment is continued daily or on alternate days for two weeks the patient will be free for months.

Surgical Treatment of Neurotic Conditions.—John W. Kenney (*Texas Medical Journal*, June, 1917) reports the result of fifty operations performed on thieves, forgers, idiots, insane, and drunkards. Decompression was performed on the idiots, thieves, and forgers. As far as benefiting the patients was concerned the results were failures. The cases of insanity and drunkenness were distinctly improved. In these cases castrations, trephinings, panhysterectomies, and oophorectomies were performed.

Treatment of Ivy Poisoning.—W. H. Dieffenbach (*Southern California Practitioner*, June, 1917), following out "autolactotherapy," fed a cow with a mixture of grass and poison ivy plant. The milk of this cow was imbibed the next day. The test was made in August and there was immunity for the rest of the summer. About one pint of milk was taken for two days and no other treatment was instituted. The following summer the patient had three slight attacks. In these attacks sal ammoniac solution, one tablespoonful to a pint of water, was applied by means of compresses for several hours, and then hot antiphlogistine poultices.

Miscellany from Home and Foreign Journals

Early Diagnosis of Diabetes.—Thomas Addis (*Journal A. M. A.*, July 14, 1917) outlines a simple procedure for the early diagnosis of diabetes before the occurrence of suggestive symptoms. The method has been used as a routine in all cases in which sugar was found in the urine in the course of the general examination, and has given most satisfactory results in a large number of patients. It depends upon the fact that in diabetes there is a diminished capacity to utilize sugar, while in the other forms of glycosuria this capacity remains about normal. In brief the method is to have the patient empty his bladder on arising, then drink one pint of water and take no breakfast. Exactly two hours after emptying the bladder and taking the water he is to empty his bladder and save the entire amount of urine passed which is to be labeled "First day, Specimen 1." Immediately after this he is to take another pint of water and eat two boiled or poached eggs without salt. Precisely two hours after the water a second specimen of urine, consisting of all the bladder contents is to be collected and labeled "Specimen 2." For the next three days this is repeated, except that twenty-five, fifty, and 100 grams of glucose, respectively, are to be taken with the first pint of water on each of these days. If the case is one of true diabetes there will be a steep rise in the sugar output with the increasing intake. If there is only some form of alimentary, renal, or other type of glycosuria, such a rise will not be observed. In renal diabetes there may be some slight rise in the output, but this is not marked and can be readily distinguished from true diabetes. The method has not failed to give trustworthy evidence in a large experience.

Neurasthenia in Soldiers of Home Forces.—F. W. Burton Fanning (*Lancet*, June 16, 1917) draws attention to the predominance of neurasthenia among newly recruited soldiers reporting sick, using the term in its widest sense—that of a disorder of the nervous system without apparent organic basis. Five hundred and nine men out of 1,600 reported sick were suffering from this condition in one or other of its varied forms. A large proportion of the neurasthenics realized that they were of a nervous temperament and that this was the cause of their disability. There were very few exceptions to the fact that the men of this class were certain of their inability to stand military service and resented being called to the colors. Some of the men were of average physical development, but the majority were of notably poor physique, not a few were actual degenerates, and very few were of a physical development beyond the average. An important diagnostic point is that the neurasthenic man never limits his complaints to any one organ or any single organic disease. There are several almost universal symptoms among these cases such as, prostration, general weakness, sense of exhaustion, and sudden collapse. The men all lack energy, are unable to concentrate or interest themselves, and are mentally preoccupied. Other symptoms common to almost all are tremors of various types, such as slight quivering of the upper lip in speaking, rapid vibratory movements of the upper eyelids when closed, or fine tremors of the extended fingers. These signs at once put the examiner on his guard and suggest neurasthenia. Cold extremities, hot and cold flashes, feeling of something creeping beneath the skin, giddiness, and profuse sweating, especially the condition of moist palms, are almost characteristic among the vasomotor phenomena. A flush across the forehead is very common, loss of weight, exaggerated knee jerks and a dry, sanded tongue are also all very common. The patients' chief complaints, in the order of their frequency, are rheumatism or rheumatic pains variously located, not necessarily in the joints; symptoms called neuritis; backache; gastritis; cardiac pains, dyspnea; pulmonary trouble, often regarded as tuberculosis; disturbances of micturition; distressing throat symptoms; and much less commonly symptoms referred to the sexual organs. In all of these conditions the characteristic evidences of the real disease are wanting, and in the cases of disordered action of the heart there is no evidence of any true affection of this organ and none to implicate the thyroid gland. Although proper treatment may serve to relieve the patient of all or most of his symptoms, these men never can be made fit for military duties, and it is best to have them undertake some useful form of occupation at home.

Diagnostic and Therapeutic Lumbar Puncture in Spinal Injuries.—Harold Neuhof (*Archives of Diagnosis*, April, 1917) asserts that in the Bellevue Hospital lumbar puncture has proved of signal aid in cases of suspected or evident spinal injury and is now performed as a routine measure. The finding of a large quantity of blood and evidence, on repeated puncture, of continuation of the bleeding constitutes one of the exceedingly few indications for operation in recent spinal traumatism. In some instances, the blood found in the spinal canal afforded the only evidence that vaguely suspected spinal injuries were actually vertebral traumas with compression of the cord. The finding of blood is of unusually great value in the presence of acute or subacute alcoholism, of coma or mental confusion, or of hysteria. In cases of skull injury blood in the spinal canal is of less value in the diagnosis of associated spinal injury, unless large amounts of fresh blood are noted. To eliminate the needle as the cause of bleeding the spinal fluid should always be collected in two or three test tubes. That lumbar puncture may obviate operative intervention in suspected cord injury was illustrated in the case of a woman in whom, after a street car accident, complete motor and sensory paralysis in the legs developed progressively. Puncture revealing clear fluid, operation was withheld, and soon after the reflexes began to reappear. As a therapeutic measure, lumbar puncture is of value to relieve compression or irritation of the cord by fresh blood, and to minimize the aftereffects.

Loss of Sight from Posterior Accessory Sinus Disease.—Leon E. White (*Boston Medical and Surgical Journal,* June 28, 1917) reviews the literature on this subject and adds three cases of his own. The results in twenty-seven cases were: Complete recovery in fourteen; improvement in seven; total blindness in one or both eyes in five; one death; four recoveries without operation. In three the sphenoid alone was opened; in ten the ethmoid alone; in seven both. In fifteen the onset was sudden, with a history of coryza in twelve and severe pain in thirteen. Pus was found in twenty-two, a thickened mucosa in five. Scotomas and fundus changes were noted in fourteen. The x ray findings were helpful in four. He divides the cases into three classes: 1, the acute ones which usually follow grippe or a coryza and are accompanied by severe pain; 2, the chronic ones where there is less pain, if any, and an empyema of one or more sinuses is causing a pressure on, or a toxemia of, the optic nerve; 3, those cases where on opening the sinuses only a thickened mucosa is found. Here hyperplastic changes are taking place and a periostitis in the sinuses by extension through the optic canal becomes a perineuritis. The treatment is drainage of the posterior ethmoidal cells and of the sphenoidal sinus.

Pressure Signs of Certain Intracranial Conditions Observable in the Fundus of the Eye.—William Sharpe (*Archives of Ophthalmology,* July, 1917) discusses the pressure signs met with in brain tumor, brain abscess, intracranial hemorrhage, and edema following fractures of the skull, selected cases of cerebral spastic paralysis due to an intracranial hemorrhage at birth, and hydrocephalus. He believes that it is rare in cases of brain tumor for a choked disc to result unless the tumor has become very large, or has caused a blockage of the ventricles and thus produced an internal hydrocephalus. It is comparatively easy to make a diagnosis of brain tumor at the stage of papilledema, the commencing stage of choked disc, and he feels that early ophthalmoscopic examination which reveals this milder pressure sign would result in the location and removal of a smaller tumor mass, as only too frequently the surgically successful removal of a brain tumor is possible and yet the patient has been damaged irreparably by the failure to recognize the pressure signs. In brain abscess there is a replacement and substitution of brain tissue by purulent detritus, so it is rare for definite signs of intracranial pressure to be observed in these cases, unless the ventricles are blocked or a toxic and infective meningitis occurs. Intracranial hemorrhage and edema following fractures of the skull rarely induce a choked disc because the intracranial pressure rises too rapidly for such a condition to be produced, but when a large hemorrhage develops slowly after such an injury a choked disc may be formed. It is most rare in cases of brain injury with or without skull fracture for an edema of the optic discs to appear within six hours. The development of a well marked choked disc should not be awaited in such cases; a blurring of the discs, twice the normal pressure of the cerebrospinal fluid, and a lowered pulse rate are indications sufficient for a decompression operation. In cerebral spastic paralysis the finding of dilated retinal veins and a blurring of the discs may indicate the cause of the condition. In hydrocephalus the ophthalmoscopic findings depend on whether it is internal, with a resulting high intracranial pressure, or external; the latter rarely causes a measurable papilledema, while the former can produce choked discs of extreme degree. Finally he emphasizes the fact that careful ophthalmoscopic examinations of the fundus are of the greatest importance in differentiating many intracranial lesions.

Primrose Dermatitis.—C. Augustus Simpson (*Journal A. M. A.,* July 14, 1917) reports the results of his observations and experiments on the etiology of primrose dermatitis, which is increasing in the frequency of its occurrence on account of the popularity of the flower. There are probably two active poisonous constituents, the one of a glucosidal nature, the other an acid constituent of the resin contained in the plant. Primrose poisoning, like many other types of dermatitis venenata, has been ascribed to anaphylaxis, but there is no evidence in support of this view and much against it. The poisons are not of a protein nature; animals cannot be sensitized to the poisons of the plant, either actively or passively; no specific amboceptors can be found in the blood of susceptible patients, and the protein bodies of the plant have no relation to the poisoning. The dermatitis belongs typically to the class of hypersensitive reactions to drugs and chemicals and has no relation to anaphylaxis. There is probably some cellular or epithelial irritability present in persons who are sensitive to this or other chemical poison, and this irritability is spontaneous and not the result of exposure.

Method of Spread of Gas Gangrene into Living Muscle.—J. W. McNee and J. Shaw Dunn (*British Medical Journal,* June 2, 1917) made extensive examinations of freshly amputated extremities and of cadavers within one or two hours after death to determine the mode of spread of gas gangrene into healthy muscle. They also conducted a series of animal experiments with results which confirmed their findings in man. They point out that gas gangrene is a disease of dead muscle, in which the bacilli live a saprophytic life with the rapid destruction of the dead tissue, producing gas and highly toxic fluid. The rapid spread of the disease from the originally infected devitalized muscle is found to be due to the anatomical structure of the muscles. These consist of long individual fibres surrounded by sheaths which are very readily detached with the formation of potential spaces into which the toxic material from the infected region passes. This detachment damages the blood supply and the toxic fluids complete the destruction of the vitality of the muscle. With this the organisms find fresh devitalized muscle and the process progresses until the whole muscle originally affected is destroyed, or until all are destroyed when more than one is infected. In the case of gas bacillus infection below the site of a complete lesion of one of the main bloodvessels all of the muscles are devitalized together and the disease spreads generally throughout the part.

Trench Fever.—H. Moreland McCrea (*Lancet*, May 26, 1917) says that a number of articles from various countries has appeared in which some evidence is adduced to show that this disease is a spirochetosis. The spirochetal nature of the disease has, however, not yet been proved. Further evidence in its favor is produced by the author. The clinical condition closely resembles a syphilitic periostitis; in the vast majority of cases the Wassermann reaction is positive, as is the case in spirochetal infections in general; and, finally, some cases respond well to intravenous injections of galyl and intramuscular injections of gray oil.

Pupillary Inequality in the Normal Subject.—A. Tournay (*Bulletin de l'Académie de médecine*, May 22, 1917) points out that while anisocoria has hitherto been held to occur, with rare exceptions, only in the presence of some local or general pathological state, this rule in reality applies only where the subject's gaze is directed straight forward. Whenever the normal subject turns the eyes strongly to one side, the pupil of that side becomes larger than its fellow. The same phenomenon can be noted, moreover, when convergence and accommodation are brought into play, the visual axes being directed at a close, laterally situated point. The pupil of the corresponding side dilates, not at once, but after an interval of a few seconds. A similar reaction, apparently, can be observed where abnormal anisocoria already exists, the difference between the two pupils being either accentuated or lessened according to the side to which the eyes are turned.

Diagnosis of Pellagra.—Edward J. Wood (*Archives of Diagnosis*, April, 1917) states that in no other diseases are the symptoms as definite as in pellagra, yet mistakes in diagnosis are numerous. In his own doubtful cases the condition later invariably proved to be another disease, such as sprue. For diagnostic purposes he divides the disease picture into the skin group, the intestinal group, and the mouth group, least in importance, but often present early. At least two of these groups almost invariably occur, except in children, in whom skin lesions may alone be present. A diagnosis is never justified in the absence of skin symptoms or a very definite history of such symptoms. Among 100 private cases seventy-seven had diarrhea, in most cases severe and resistant to all treatments except high vitamine feeding. Subsidence of diarrhea is of great prognostic import. Lately pellagra in the South has lost much of its original virulence. Mouth symptoms were present in seventy-three cases. Their duration may be so short that failure to record them must be frequent. Close definition of these symptoms is inadvisable; it is enough to say that there is an acute stomatitis and frequently an esophagitis. The mouth symptoms of sprue cause the greatest confusion with pellagra, but the former shows a marked secondary anemia and no skin lesions. The backs of the hand and lower posterior surfaces of the forearms are almost constantly the site of pellagrous skin lesions—ninety-seven cases. No skin lesion should be counted pellagrous if symmetry is wanting. The hyperkeratotic border of Merk and the concentric layers are also significant. The psychosis of pellagra is too indefinite to be of diagnostic value.

Isolated Nasal Diphtheria.—J. D. Rolleston (*British Journal of Children's Diseases*, March, 1917) gives the percentage of isolated cases of nasal diphtheria, originating in and confined to the nose, as 1.5 per cent. It is most frequently seen in young children and is more prevalent in the cold months of the year. Congenital syphilis is a predisposing cause. The great majority of the cases run a mild course, but rare examples of toxemic diphtheria confined to the nose do occur. The mild course has been proved to be due to autoimmunization. Chronicity is a characteristic feature of isolated nasal diphtheria, the presence of the bacilli being explained on anatomical grounds. Sequelæ are occasionally seen, but are rare. Local treatment should be avoided, but antitoxin is indicated. The term "fibrinous rhinitis" should be reserved for comparatively rare cases in which this form of rhinitis is due to other causes than the diphtheria bacillus. The practical significance of isolated nasal diphtheria consists in its epidemiological importance.

Decalcification of the Bones in War Traumatisms.—E. Delorme (*Bulletin de l'Académie de médicine*, May 8, 1917) in examining 1,350 bone radiograms accumulated at the Grand Palais, Paris, found more or less extensive osseous decalcification in one half of all injuries of the metacarpus, radius, humerus, tibia, and both bones of the leg, in a little over one third of the injuries of the femur, and in one fourth of the injuries of the ulna. These do not, of course, comprise recent cases in which the bone disturbance has not as yet had time to become established. The importance of nerve injury as a factor in the decalcification is illustrated in that among fifty-four cases of old nerve injuries in the upper extremity, forty-one showed bone decalcification. Again, among thirty-seven cases of injury of the sciatic nerve or its branches, twenty-three showed decalcification. While injuries of large nerve trunks seemed especially potent as a factor in this condition, several plates showed marked trophic bone disturbance where very small nerves could alone have been injured. Of seven cases of ligation of a large arterial trunk, only one showed a slight decalcification. As a rule, the decalcification is of such a type as to render the affected bone more transparent to the x rays, the outer layer of the bone, however, standing out more prominently—though narrower—than usual. In some instances, however, especially in the short bones, the change consists merely in the assumption of a dark, soiled appearance throughout the bone, with the cortex less clearly defined and the bone as a whole streaked with linear, longitudinal dark spots, alternating with paler intervals or blotches. Careful comparison of plates seemed to show that this condition represents a preliminary stage of the bone disorder, passing later into the more definite decalcification already referred to. In the treatment of bone decalcification, to which as yet little attention has been paid, electrical procedures seem to have proven inefficient. Administration of phosphates, lime, magnesia, iron, silica in the form of mineral waters, and appropriate foods, together with arsenic in small doses and cod-liver oil in moderate doses, as recommended by Robin, is expected to give better results.

Proceedings of National and Local Societies

THE MEDICAL SOCIETY OF THE STATE OF NEW YORK.

One Hundred and Eleventh Annual Meeting. Held at Utica, April 24, 25, and 26, 1917.

The President, Dr. MARTIN B. TINKER, of Ithaca, in the Chair.

(*Concluded from page 195.*)

Differential Diagnosis of Enlargements of the Cervical Lymph Nodes.—Dr. ROYAL S. HAYNES, of New York, said that enlargements of the cervical lymph nodes fell into the following classes: 1, inflammations, simple or tuberculous; 2, hyperplasias, and 3, neoplasms. These pathological processes were not confined strictly to particular disease entities. Lymphadenoma, lymphosarcoma as primary diseases, and carcinoma as a secondary process represented least common types of the neoplasms. The commonest forms of enlargement of the cervical lymph nodes were the infections or enlargements secondary to bacterial invasion of structures of the head and throat whose lymphatic drainage terminated in one or other of the group of lymph nodes situated in the superficial and deep structures of the neck. They were of the greatest etiological, diagnostic, and therapeutic importance. When enlargements of the cervical lymph nodes, excepting those due to infections, could not be differentiated the signs of disease elsewhere which ordinarily accompanied them helped to establish a diagnosis. In enlargement of the lymph nodes of the neck, the location of the group first enlarged would go far to indicate the primary focus and would give some information as to the type of infection. Later there was no such definiteness. An adenitis in a child under two years of age was probably simple rather than tuberculous; in persons over two years of age it was likely to be tuberculous rather than simple. A valuable point in diagnosis was whether or not raw milk or milk from tuberculous cows had been given the child. Personal and social hygiene and contact with tuberculous individuals were important matters. Tuberculous adenitis was rarely acute in its onset. An abrupt onset, fever, rapid swelling of the lymph nodes, tenderness, edema, and matting together indicated pyogenic infection. A slow increase of the swelling with gradual involvement of more than one node, delayed cellular tissue infiltration, and delayed amalgamation of the skin, and deeper structures spoke for tuberculosis. In tuberculous cervical adenitis of early infancy, however, the picture at the onset described for acute pyogenic infection was likely to be present. Enlargement of cervical lymph nodes of over three months' duration was presumptively tuberculous. Recurrent mild infections from adenoids might leave the lymph nodes enlarged without the ability to resume their original size. The location of the nodes might be the same in both varieties of infection. Inflammation of the structures in the mouth, throat or nasopharynx was probable when enlargement of the lymph nodes was due to pyogenic infection. The absence of such inflammation in the presence of cervical swelling was significant of tuberculosis. An infectious pyogenic process in addition to the tuberculosis would give a leucocytosis with polymorphonuclear increase in this type also. The anemia of the tuberculous type would probably be more profound. In the tuberculous enlargement the tuberculosis complement fixation test should be positive and negative in simple adenitis. In simple adenitis, however, it might be positive when there were foci of infection elsewhere. A negative von Pirquet reaction was valuable evidence of pyogenic infection. Röntgen ray examination of the head disclosing tooth abscesses, for instance, would indicate pyogenic infection. Röntgen ray examination of the thorax showing extensive tuberculous involvement would indicate the same. The evidence from excised tonsils or adenoids might often be inconclusive. Tubercle bacilli might be obtained from aspirated softened areas of the enlarged mass, or pyogenic organisms or the pus might be sterile, an indication that the process was tuberculous. With all these aids, a positive diagnosis could not be made until the gland itself was excised and examined.

Hodgkin's disease might present a confusing picture, but here the progressive enlargement without coalescence and suppuration, the involvement of other groups of nodes, particularly within the thorax and abdomen, the splenic enlargement, the progressive anemia, and the finding of characteristic Hodgkin's hyperplasia on section of a removed gland would serve to differentiate. Enlargements in lymphosarcoma bore a certain resemblance to those of Hodgkin's disease, but the capsule of the node had a tendency to rupture and the nodes became adherent to each other and to the surrounding tissue. The course was rapid. Acute lymphatic leucemia only needed differentiation from cervical enlargement. In its early stage it presented enlargements of nodes up to the walnut size, with little or no redness or tenderness. Later when hemorrhagic changes in the mouth and throat took place, infection was often added to the picture. The diagnosis would be made by examination of the blood. Anemia with one to three million red blood corpuscles, hemoglobin twenty to thirty per cent.; leucocytes 60,000 to 150,000 of which ninety to ninety-eight per cent. were lymphocytes most of the large variety, were the expected findings.

Relation of the Nose and Throat to Cervical Adenitis.—Dr. GEORGE BACON WOOD, of Philadelphia, said that there were no statistics or other absolute data concerning the relative importance of the nose, throat and mouth as the starting place for cervical adenitis. He believed that ninety per cent. or more of the cases of cervical adenopathic infection had their original focus within these organs. He would place the faucial tonsil first in the order of importance; the pharyngeal tonsil and other lymphatic structures of the pharynx came next, including the lingual tonsil, gums, alveolar processes; last the nasal cavities and accessory sinuses. The point of infection in all of these struc-

tures might be hidden. Occasionally lesions of other parts of the mucous membrane gave rise to adenitis. The method of bacterial invasion of the tonsillar parenchyma in ordinary cases of acute tonsillitis was studied and showed vulnerability of the cryptal epithelium. As far as chronic adenopathy was concerned the most important glands of the neck were the terminal or deep glands. These formed a perpendicular chain beneath the sternocleidomastoid muscle into which all the afferent collectors of the more superficial glands emptied. These glands emptied into each other and terminated usually in a single large trunk called the jugular lymph trunk. The anatomy of these chains of glands explained the mode of infection. Most cases of chronic cervical adenopathy were of the descending type and usually began with enlargement of the tonsillar lymph node. The next most important group started in the upper glands of the external group of the deep cervical chain just behind the posterior border of the sternomastoid. Primary enlargement of the superficial chain rarely initiated the chronic form of adenitis. The importance of the mouth, nose, and throat in the etiology of the cervical adenopathy is evident when it is remembered that practically the only afferent vessels running to the deep cervical chain came from some part of the upper digestive and respiratory apparatus. If the glands involved began with those under the posterior portion of the sternomastoid muscle the tonsils and mouth could be ruled out. In the large majority of cases infection came through the pharyngeal tonsil. The posterior gland of the submaxillary group was involved primarily in alveolar infection. Where the tonsillar lymph node was the first to be enlarged the infection must surely come through the faucial tonsil, the lingual tonsil, or possibly the lateral folds of the pharynx.

Relation of Teeth to Enlarged Glands.—Dr. THOMAS B. HARTZELL, of Minneapolis, said that during the last five years research had not thrown any additional light on tuberculous, syphilitic and carcinomatous lymphatic invasion. He believed that mouth infections should be regarded as a result of the organisms which were habitually found in the mouth and which had the power to invade the tissues. This reduced the field of intensive study to a comparatively small number—the fusiform bacillus, the mouth spirochete, Leptothrix buccalis, and the streptococcus. Research showed that of these the streptococcus was the primary cause of the various dental infections. The staphylococcus was one of the active factors in acute alveolar abscess, but was regarded as unimportant in the chronic alveolar abscess. Staphylococcus was not an important factor in cervical lymph adenitis. Streptococcus salivarius was absolutely constant in the mouth. Streptococcus viridans was found to have the power of penetrating tissues and of causing metastatic lesions in all parts of the body. Unquestionably it produced a toxin, and the speaker believed that it was the organism mainly responsible for most of the important dental lesions, including inflammation of the dental pulp. It was certainly the chief cause of pyorrhea. It could and did invade the lymphatics, and swollen lymph nodes were often observed in direct continuity with the lymphatic drainage from the gums and peridental tissues which had receded rapidly due to stamping out of the growth of this organism in the tissues contiguous to the teeth. This organism gave rise to a nonsuppurative lesion in the beginning, which might become suppurative as the destruction of the peridental tissues progressed. The suppurative character of the pyorrheal process, however, was grafted upon the initial lesion produced by the streptococcus and was secondary to the streptococcal invasion. The chronic dental abscess, or so called granuloma, was more important than the pyorrheal pocket as a focus of infection to the lymphatics and blood stream. Clinically, the invasion of the cervical lymphatics by Streptococcus viridans presented a fairly constant picture of low grade infection involving swelling of the lymph nodes and slight tenderness to pressure with or without slight variations of temperature. On account of the narrow range of temperature Streptococcus viridans lymphadenitis was often mistaken for incipient tuberculosis. A careful examination of the mouth and jaws was of greatest value in children. A decided increase in weight and vigor was often observed to follow the removal of dead pulps of teeth and the curettement of abscesses. In these cases the extraction of the deciduous teeth was safer than attempted sterilization. Sublingual gland infections from pyorrhea pockets and deep gingival crevices which were exceedingly common and frequently pass unrecognized might give rise to metastatic infections of heart, kidney, and joints. Patients should be taught to report such conditions, thereby enabling the physician to eradicate these foci of infection. Heart disease, according to the statistics of the United States Government from the registration area, was a greater menace to life than tuberculosis. Heart disease, which was ninety per cent. streptococcal in its origin, was to a large extent preventable. When teeth had to be extracted they should be taken at intervals of five to seven days; the speaker had seen in the last two years four deaths resulting from wholesale extraction of teeth. These deaths were due to the circulation reaching a point of saturation with the toxins of the infecting organism; the granulating walls around the areas of inflammation were broken down and the patient was overwhelmed by a mass of living organisms thrown into the circulation at one time. The same was true of pyorrheal infection. He advocated the same caution in the removal of the tonsils. It was vastly better to remove one at a time if the patient was near the point of saturation with streptococcal toxins.

X Ray Treatment of Enlarged Cervical Glands.—Dr. GEORGE E. PFAHLER, of Philadelphia, said that if there was suspicion of disease in the tonsils, lymphatics, or teeth when a case was presented for treatment we should first search for the source of infection and remove it. Glands which were soft, fluctuating, or tender should be incised and drained. If the glands were not soft and the case was of recent origin, less than six months, they could usually be made to disappear by the Röntgen rays

properly administered. An operation upon a child for cervical adenitis should be followed by at least one or two full courses of postoperative treatment. A gland which was tender at the beginning of the x ray treatment would almost certainly become softened and red on the surface and finally show signs of pointing. It should then be incised and treated as an abscess and the x ray treatment should be continued. A complete dissection of the glands of the neck would not be necessary in such instances, and there would only be a small, scarcely visible scar at the site of the incision. The hygienic conditions of the patient should be improved and the sources of infection, such as the milk of a tuberculous person, should be removed. In general the technic of deep röntgenotherapy should be applied in cervical adenitis. The speaker's technic at present consisted in the employment of hard rays thoroughly filtered, i. e., rays from a tube which would back up a nine inch parallel spark gap, equivalent to approximately nine on the Benoist scale. These rays were filtered through six millimetres of aluminum and applied for forty milliampère minutes through each portal of entry. The hair and face must be thoroughly protected by sheets of lead. The focal distance from the target to the skin was eight inches. In general the application to two portals of entry for one side of the neck would be sufficient; in severe cases four or more portals of entry might be necessary. Doctor Pfahler drew lines downward along the anterior border of the sternocleidomastoid muscles and then directed rays anteriorly through the neck and then posterior to this line toward the deeper portions of these glands. After a month, during which the treatment was not repeated, there was usually a decided reduction in the size of the glands. Cumulative effects and dermatitis, or even a redness of the skin, should be avoided in treating these cases. A severe dermatitis threatened subsequent development of a telangiectasis. Röntgen therapy should be employed in these cases only by a skilled röntgenologist and never by an orderly or a nurse. Today thousands of x ray machines were employed by men who might be competent in other lines of medicine, but who were quite incompetent in röntgenology.

Indications for Removal of Enlarged Cervical Lymph Glands.—Dr. Charles N. Dowd, of New York, said that tuberculous infection here gave the main indication for surgery. Hodgkin's disease and lymphosarcoma occasionally called for surgical interference. Hyperplastic inflammation seldom called for surgery. Progressive tuberculosis of the cervical lymph nodes manifested itself in two main forms, caseation and abscess formation which constituted about eighty per cent. of cases. When this stage was reached diagnosis was simple. Before the abscess was formed the enlarged lymph node just below the angle of the jaw was characteristically much larger than the surrounding nodes, was fairly soft, and was more or less attached under the anterior border of the sternomastoid muscle. In the remaining twenty per cent. the lymph nodes enlarged without abscess formation, and might extend throughout the neck from the mastoid to the clavicle, and from the internal jugular vein backward under the trapezius, and forward under the jaw. They were rather hard, not easily movable and matted together. They were not as distinctly shown as localized as the caseating variety; they tended to progress intermittently. Enlarged upper cervical nodes of this variety in childhood might be massed throughout the neck in adolescence or in early adult life. Hyperplastic nodes showed a tendency to subside. If these factors were fully considered, the clinical differentiation between tuberculosis and hyperplastic cervical lymph nodes could usually be made. In a series of 726 cases the earlier cases gave wonderfully good results and it was clear that childhood was the best time for operation. If neglected, they might develop into the undesirable types of cases. It was very important that there should be more adequate understanding of the real surgical problem. The practical considerations were: 1, uncertainties in diagnosis; 2, technicalities in operation; 3, recurrences in late and unfavorable cases. Uncertainties caused two types of error: When tuberculosis was present and was unrecognized, the patients drifted past the most favorable time for successful operation, and when simple hyperplastic glands were mistaken for tuberculous glands the treatment resulted in confusion. The simple incising of an abscess without discovering and removing the glands that lay back of it was particularly unfortunate and should not be called an operation. The term operation here meant the removal of the infected glands and the tuberculous detritus which came from them. The technicalities of the operation should not be neglected. The speaker had seen cases in which important nerves had been severed, as the facial and the spinal accessory, before its entrance into the trapezius muscle. After an extensive study of all forms of treatment and visits to institutions where they were used, he did not advocate long periods of treatment which gave uncertain results when there was a simple short treatment which gave such good results, except in cases of diffuse tuberculosis in which radical removal was impossible or very difficult.

Dr. Thomas S. Southworth, of New York, stated that in these cases there was nearly always a history of nasopharyngeal involvement, or common cold, as the source of the lesion. If the fever persisted, suppuration took place within a week or two. As a pediatrist he had been at variance with the general surgeon in the treatment of this acute abscess. The general surgeons opened freely such a lesion and packed it with gauze. The gland must be broken down before incision should be made. If there was fluctuation, pointing, and redness, the abscess could be incised for three eighths of an inch, the skin stretched, and the pus removed by gentle pressure and a small drainage tube put in. The contraction of these abscesses was rapid and left a minimal scarring. These cases could be aborted by special attention to the nasopharynx to prevent further absorption. The older the child, the more favorable the prognosis. The subsidence was slow; if it did not take place, a mixed tuberculous infection should be suspected.

Dr. DeWitt H. Sherman, of Buffalo, said that a large number of the cases of adenitis that came to

the surgeon were tuberculous. The acute nontuberculous types were very often preceded by a rapid rise and fall of temperature, lasting from one to four days, with recovery. Many of this sort of cases which he had seen, had been caused by infection of the pharyngeal tonsil. The temperature variation might be as large as six degrees. Many of these patients had had a severe adenitis, and unless damage to the gland was great, they got well, provided they did not fall into the hands of the surgeon.

Dr. H. W. Frauenthal, of New York, said the discussion seemed to be confined so far to the seven per cent. admittedly tuberculous cases of the cervical glands. Of other cases, seventy-five per cent. were stated to be staphylococcus infections and about twenty-five per cent. streptococcus. He had seen many cases which were straight syphilitic with secondary infection. Many children, apparently well, had syphilis, many of whom had general gland involvement and secondary infections. They could be helped by drainage, but they could also be treated by antisyphilitic treatment. Twenty per cent. of the children seen had had congenital syphilis.

Dr. Harry R. Trick, of Buffalo, said that cases where the nodes indicated a series of enlargements with retrogression were general tuberculosis. In the sanitarium in Buffalo the Rollier treatment was used and its results were most satisfactory. He was impressed with the careless nomenclature in these cases; the involvement of nodes or glands was spoken of indiscriminately. Would it not be well worth while to correct this carelessness?

Doctor Barnes, of Herkimer, said an important point in the prevention of some of these infections was filling the mouth full of water after meals and washing it around, exerting suction on all parts of the mouth, including the tonsillar crypts and pockets.

Dr. Thomas B. Hartzell, of Minneapolis, stated that the teeth had an important bearing on these cases. They were undoubtedly the source in the milder streptococcic type. He would like to ask if it was wise to operate on glands without having the tuberculin test. Some of these cases might not have been tuberculosis.

Dr. George E. Pfahler, of Philadelphia, said that his experience coincided with that of Doctor Wood and Doctor Dowd, but the forty-two per cent. recurrences which were quoted could be eliminated if treated postoperatively. Another point was that it was very inadvisable to cut into Hodgkin's cases. He had seen many horrible developments of Hodgkin's disease caused by taking away a gland for investigation. The glands rapidly enlarged, and the patient became much worse. This was unjustifiable unless in exceedingly doubtful cases.

Dr. C. N. Dowd, of New York, endorsed the remarks of Doctor Southworth about opening abscesses in children. The day for large incisions had gone by. A little nick could be made and there would be practically no scar. As regards syphilitic cases, he had seen many combination cases, syphilis and tuberculosis. In these the glands should be removed and antisyphilitic treatment should be instituted. If the operation was omitted, they would have to come later anyway. As to the Rollier treatment, he had seen patients take treatment for one year that he felt sure could have been cured in half an hour surgically. The treatment was all very well after the operation, but did not take the place of operation. He was glad to hear the matter of nomenclature mentioned. He had worked on nomenclature and always spoke of the lymph nodes, but he found an increasing tendency to speak of lymph glands, although there was no analogy between the salivary glands and the lymph nodes. The tuberculin test made many mistakes, and he would rather rely on the appearance of the gland. There was no question as to the good results of postoperative x ray treatment.

Book Reviews

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

Impotency, Sterility, and Artificial Impregnation. By Frank P. Davis, Ph. B., M. D., Fellow American Medical Association; ex-Secretary Oklahoma State Board of Medical Examiners; Former Superintendent Oklahoma State Institution for the Feebleminded, etc. St. Louis: C. V. Mosby Company, 1917. Pp. 138.

This small volume covers the entire field in a very concise and practical way. Beginning with a chapter on sexual instinct, it is shown how sexual desire is affected by the different senses. Impotency is discussed at length and it is pointed out that the mind is a large factor in bringing about this condition. The effect of impotency may be so far reaching that it changes a man's life, interfering especially with his ability to carry on his business affairs. The treatment of this condition is discussed under the divisions of local, internal, and surgical treatment. An interesting study of the results of asexualization operations performed in the Kansas School for the Feebleminded is given in the chapter on Emissions and Masturbation. The author shows that there is a steady decrease in the birthrate of all Christian countries, France being the greatest sufferer. Considering the subject of sterility the various causes which act in both male and female are enumerated and the conclusion that the percentage due to male causes is about fifteen per cent. is reached. The technic and a list of the instruments required for artificial impregnation constitute a chapter and the one devoted to therapeutics includes a list of the drugs used in the treatment of these three conditions, together with dose and method of administration. The book is of exceptional merit, as it deals with the subject in a thoroughly practical manner, omitting lengthy descriptions of theories as to the causation of the conditions under consideration.

Some Personal Recollections of Dr. Janeway. By James Bayard Clark. New York and London: G. P. Putnam's Sons. 1917. vii-36. (Price $1.00.)

Six years ago a great physician rounded out his three score years and ten and passed on to the great beyond. Modest, unassuming, hating notoriety, in spite of himself his name became one to conjure with, and the fame of his achievements was spread abroad. In the present little volume Doctor Clark, who had the good fortune to be a friend of Doctor Janeway, has drawn with a few strokes a sympathetic picture of the great man. It is a book for every physician to own. When the public shows a tendency to follow false gods, when notoriety seekers usurp all the places in the sun, and when the doctor is weary of routine and monotony and ingratitude, let him turn to this little book and call to mind the great healer who was, and take heart from the story of his life. Doctor Clark is to be envied in having been close to such a man, and he is to be congratulated on having produced a perfect tribute to his memory.

After Office Hours

A real doctor, a neurotic woman who puts pet dogs above human life, and their love affair which goes on to its logical termination, may be found in the story, Little Dogs, by Wallace Irwin, in *Harper's Bazaar* for August.

* * *

The campaign against alcohol is still being waged by that female crusader, Elizabeth Tilton, who in The Wets—and the West, in the *Survey* for July 21st, deplores the political blunder—or stratagem, depending on your point of view—of tacking on prohibition as a rider to the food bill.

* * *

The logic of the advertiser, particularly a certain sort of advertiser, is indeed weird. In an advertisement of a health(?) food in the *American Review of Reviews* for August we find a testimonial from Arnold Bennett, as follows, "The tonic effect of ——— is simply *wonderful!*" The advertiser then goes on coolly to say, "In the face of such unparalleled proof, etc."

* * *

A doctor with a sneaking soul, the kind that makes quacks, is admirably depicted by Sinclair Lewis in the *Saturday Evening Post* for August 11th, in a story called The Whisperer. This particular skunk's sphere of activity is a drug company; he manages to worm himself nearly to the top of it, undermining many better men than he by the way before the crash comes. Sinclair Lewis knows the business world thoroughly, as witness his book, The Job, which tells the life history of a stenographer with marvelous verisimilitude.

* * *

After reading the book reviews in the New York *Times* it is refreshing to turn to those in the *Survey* which deal with books on science, sociology, economics, psychology, religion, and industry with as much earnestness as if they were best sellers. Ample space is given to these reviews, they are appreciative and, for the most part, intelligent and just. The July 28th number, for example, is given up to "Notable Books by Women" and discusses many interesting volumes, the one which attracted us the most being "The Mentality of the Criminal Woman," by Jean Weidensall. Doctor Weidensall has had five years' experience at the Laboratory of Social Hygiene at the Bedford Hills Reformatory for Women.

* * *

When the sun sinks to rest in the Sunny South and shadows creep over the land, sleep comes with its dreams—and now and then a nightmare. This is the race question. Much paper has been discolored in discussing it, yet we doubt if much more of value has been said than is contained in two recent books. His Own Country, by Paul Kester, tells of a Virginia quadroon who, having made a fortune in Canada, returns to his native State and tries to make its people accept him at the valuation at which he has been held in the North. The result is, of course, cataclysmic. The other book, The Autobiography of an Ex-Colored Man, gives an extremely accurate picture of the social life of the negro, North and South. The author, who is white in appearance, instincts, and aspirations, but has a spoonful of negro blood somewhere in his veins, finally manages to pass the line and is accepted by the dominant race.

* * *

In the *Current Opinion* for August, neatly trimmed to fit exactly one page, is an article called Is the Psycho-Analyzed Self a Libel on the Human Race? The title sounds promising, but when we come to examine the text we find the usual thing, extracts from another article, interlarded with a thin cement of trite comment. The other article is by Dr. Joseph Jastrow. It will perhaps be sufficient to quote one sentence: "One may wish that the Freudian psychology had been built up by men more alive to the varied springs of action in refined persons, more sympathetic with the delicate products of intellectual insight, less absorbed in the revolting aspects of a degenerate humanity." Heaven save the mark! It is as if one turned with an esthetic shudder from the spectacle of a surgeon extirpating a cancer and said: "How disgusting! Why doesn't he interest himself in the beautiful bodies of the ancient Greeks, or in rhythmic dancing, instead of groveling about in fetid flesh?"

Official News

United States Public Health Service:

Official list of changes in the stations and duties of commissioned and other officers of the United States Public Health Service for the seven days ending August 8, 1917:

Bahrenburg, L. P. H., Surgeon. Relieved from duty at Little Rock, Ark., and will return to status of sick leave.

Faris, James B., Assistant Surgeon. Relieved from duty at Ellis Island, N. Y., and ordered to proceed to Cape Charles Quarantine Station for duty.

Foard, F. T., Scientific Assistant. Ordered to proceed to Petersburg and other places in the State of Virginia for investigation of the milk problem.

Grubbs, S. B., Surgeon. Relieved from duty at Boston Quarantine Station and ordered to proceed to Virginia, between York and James Rivers, for special temporary duty.

Lumsden, L. L., Surgeon. Ordered to report at the Bureau of Medicine and Surgery, Washington, D. C., for conference regarding studies of rural sanitation.

McMullen, John, Surgeon. Ordered to report at the Bureau, Washington, D. C., for conference regarding trachoma work.

Mustard, H. S., Assistant Surgeon. Ordered to proceed to Des Moines, Ia., on special temporary duty.

Oakley, J. H., Surgeon. Granted three days' leave of absence from August 7, 1917.

O'Brien, H. R., Scientific Assistant. Ordered to proceed to Des Moines, Ia., for special temporary duty.

Quinn, M. J., Scientific Assistant. Ordered to proceed to Des Moines, Ia., for special temporary duty.

Schereschewsky, J. W., Surgeon. Ordered to proceed to Barksdale, Wis., to continue investigations of industrial sanitation.

Sprague, E. K., Surgeon. Relieved from duty at Little Rock, Ark., and ordered to proceed to Des Moines, Ia., for special temporary duty.

Stevenson, A. F., Sanitary Chemist. Ordered to proceed to Petersburg and other points in the State of Virginia for investigation of the milk problem.

Sydenstricker, Edgar, Statistician. Ordered to proceed to Bolivar and neighboring counties in Mississippi for studies of food availability in connection with the incidence of pellagra.

Wayson, N. E., Assistant Surgeon. Ordered to proceed to Elkton, Va., on special temporary duty.

Wilson, J. G., Assistant Surgeon. Relieved from duty at Little Rock, Ark., and ordered to proceed to Chillicothe, Ohio, on special temporary duty.

Wrightson, W. D., Sanitary Engineer. Ordered to proceed to Annapolis Junction, Md., on special temporary duty.

Births, Marriages, and Deaths

Married.

Holt-Hyatt.—In Cincinnati, Ohio, on Tuesday, July 31st, Dr. Earl E. Holt, of Cincinnati, and Dr. Evelyn P. Hyatt, of Cincinnati.

Harvey-Johnson.—In Freeport, Ill., on Saturday, July 31st, Dr. Harold Harvey, of Rockford, Ill., and Miss Elvira Marie Johnson.

Died.

Carter.—In Lynnville, Tenn., on Monday, July 30th, Dr. Robert H. Carter, aged seventy years.

Donnelly.—In Gardner, Mass., on Thursday, August 2d, Dr. John B. Donnelly.

Laden.—In Hartford, Conn., on Thursday, August 2d, Dr. Michael R. Laden, aged forty-three years.

Maxfield.—In Hudsonville, Mich., on Wednesday, August 1st, Dr. Warren A. Maxfield, aged forty-six years.

Page.—In Lewiston, Me., on Thursday, July 26th, Dr. Leslie T. Page, aged fifty-one years.

Russell.—In Springfield, Ohio, on Friday, August 3d, Dr. Linus E. Russell, aged sixty-eight years.

Smith.—In Syracuse, N. Y., on Tuesday, July 31st, Dr. Frederick W. Smith, aged fifty-nine years.

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Collectanea

The Rank of the Chief Medical Officers of the Army.—It has come to be a recognized principle in the British and Continental armies, says Dr. Simon Baruch in a communication to the New York *Sun* recently, that the officers of the medical corps should receive the rank and position to which their responsibilities entitle them in order to carry effectively into execution their suggestions with regard to the hygiene and sanitation of the commands to which they are attached. Medical officers have hitherto been too much engrossed with their professional duties to note that the latter differ materially from those of civil life, in which advice is given without the authority of command. The responsibilities of military practice are so much greater and more vital than those of the civilian practitioner because of the far greater numbers of those for whom medical suggestions are made and the more vital issues involved in campaigns. But the chief difference between the civilian and the military medical man lies in the fact that the latter is chiefly concerned with sanitation or the prevention of disease rather than its treatment, while the former is practically relieved from this function by the health officer, who today is found even in small communities.

That the military service has suffered, sometimes fatally, on account of the absence of higher rank among medical officers may be proved by abundant evidence. One needs but to read the report on "Conduct of War Department in War with Spain" (VI, 3,080) to discover a flagrant example of the fatality resulting from absence of the authority which only high rank gives to medical officers. The command of General Brooke, consisting of about 40,000 men, suffered from typhoid fever, which crippled twenty-five per cent. of the command, of whom 700 died. Besides, the large number of soldiers required to nurse and bury these men was a serious loss to the service. The General's own testimony expressed contempt for the advice of his own medical officers.

Referring to a well that had been condemned by the latter, he testified: "I drank of that well every time I passed it, until somebody broke the pump to pieces. I suppose it was some of our energetic medical fraternity who had spent their time in finding that there was a suspicion of these two wells, and then I did not bother further about it." Of another well in front of a South Carolina regiment which had been condemned by "alleged medical departments" the General said: "According to my investigation this was erroneous. I believe this really to have been perfectly pure water. There was afterward discovered a surface well which had been walled up and water slipped in, from which this regiment—this was reported to me—used the water. That well was not far from a sink and possibly on lower ground. I never could understand from my knowledge of rocky strata how that well could have been contaminated." Nevertheless, this general officer had more confidence in his own judgment than in that of his own medical officers. That he was not infected was due to his having been immunized by a previous attack of typhoid fever.

On July 17, 1898, the chief medical officer of Chickamauga wrote to the Adjutant-General nine definite recommendations for the proper sanitation of the camps. These remained unheeded, and General Brooke testified: "I did not regard his letter in a very serious sense. I do not know how he came to write it. He caused me more trouble and annoyance than any one ever did. There was much complaint in that camp from men of his own profession as to his action." There is no doubt that if the medical officer had had the rank and authority to enforce his recommendations, despite their not being regarded as "serious" by the commanding officer, the hospitals and graves of Camp Thomas would not have been filled so abundantly.

It is the aim of the Owen amendment to the national defense act reported June 8, 1917, to fix the rank of army medical officers so that the obstinacy or perverseness of the officers of the line may be nullified by giving medical officers the authority to act in matters of sanitation at least. It is a well known fact that the health officer in civil life is invested with "police power." The giving of high rank to the military medical officer would approximate this necessary authority in military life. The Owen amendment contains a very modest demand in view of the higher rank of medical officers of the British army, for instance, which in October, 1916, included in the medical service four lieutenant generals and twenty-one major generals. The Italian, German, French, British, Japanese, and Austrian armies each had one or more lieutenant generals in their medical service. Let us take counsel from this trustworthy source.

New Publications Received

Modern Dietetics. Feeding the Sick in Hospital and Home, with Some Studies on Feeding Well People. By LULU GRAVES, Dietitian, Lakeside Hospital, Cleveland. St. Louis: The Modern Hospital Publishing Company, 1917. Pp. xii-214.

Alcohol. Its Relation to Human Efficiency and Longevity. By EUGENE LYMAN FISKE, Medical Director, Life Extension Institute. Authorized by the Life Extension Institute. Reviewed and Criticised by Members of the Hygiene Reference Board and Approved by a Majority. New York and London: Funk & Wagnalls Company, 1917. Pp. xx-216. (Price $1.)

Good Health. How to Get It and How to Keep It. By ALVAH H. DOTY, M. D., Author of The Prevention of Infectious Diseases The Mosquito, A Manual of Instruction in the Principles of Prompt Aid to the Injured, etc. Illustrated. New York: D. Appleton & Co., 1917. Pp. xiv-304. (Price $1.50.)

Poliomyelitis in All Its Aspects. By JOHN RUHRÄH, M. D., Professor of Pediatrics in the University of Maryland Medical School and the College of Physicians and Surgeons; Consulting Pediatrist to the Bayview Hospital and to the Church Home and Infirmary; Visiting Pediatrist to the Mercy Hospital, etc., and ERWIN E. MAYER, M. D., First Lieutenant in the Medical Officers' Reserve Corps, United States Army; Former Senior Resident Physician at the Mercy Hospital; Instructor of Medicine in the University of Maryland Medical School and College of Physicians and Surgeons. Illustrated with One Hundred and Eighteen Engravings and Two Plates. Philadelphia and New York: Lea & Febiger, 1917. Pp. viii-297. (Price $3.25.)

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are prevented by the
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which, when well mixed with the feces, prevents their getting hard. Instead of HARD DRY FECES, the patient has SOFT PLASTIC FECES, obtaining easy evacuation without straining at stool, and life becomes worth living—so far, at least, as INTEROL'S combating of his obstipation-stasis-autotoxemia is concerned.

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"The Greaseless Anodyne"

Repeat when necessary, washing off the previous application.

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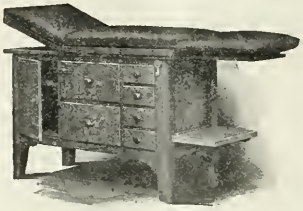

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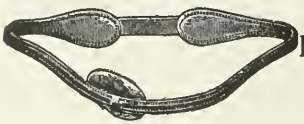

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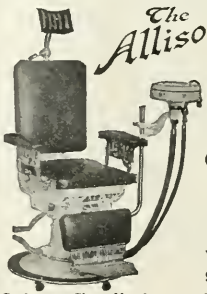

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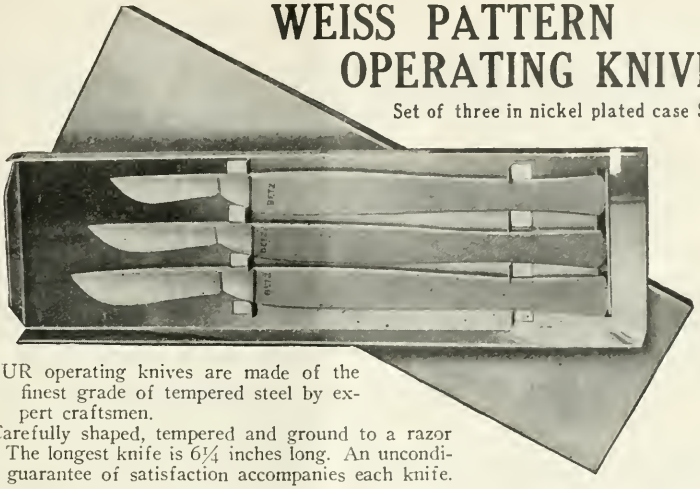

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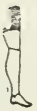

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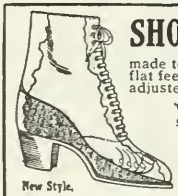

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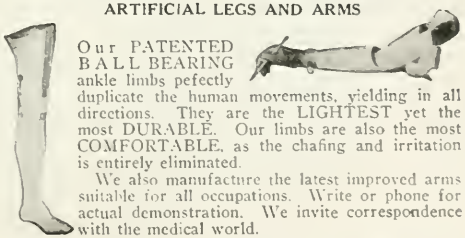

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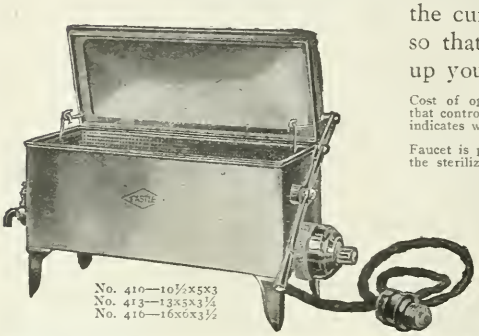

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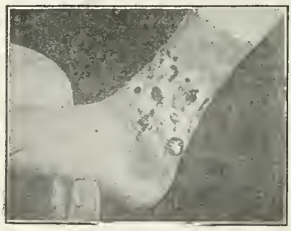

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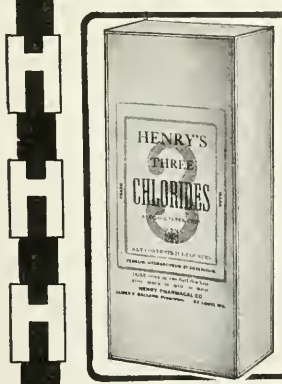

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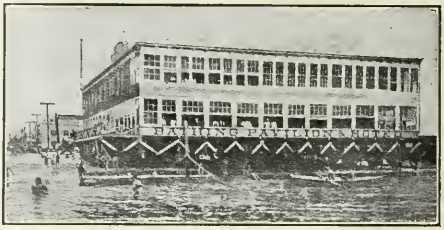

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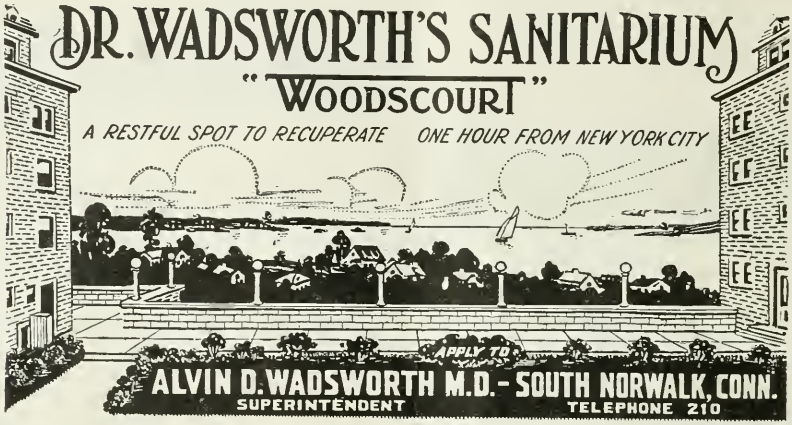
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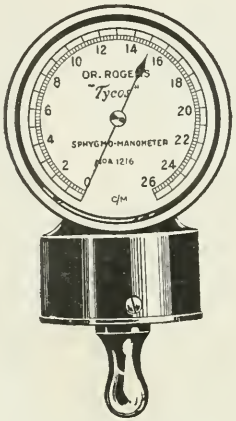

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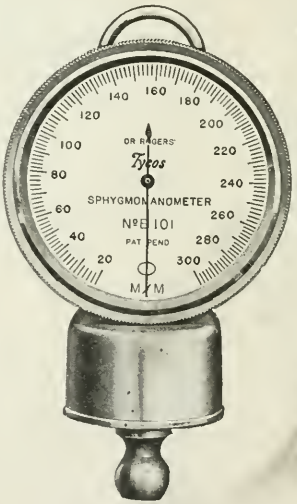

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